Buffalo Potter Distributor Gets into the Christmas Spirit

These window displays—all featuring Potter refrigerators—are being used by A. R. Weber, Inc., Buffalo distributor, to halt passing shoppers and convince them that an electric refrigerator makes an unbeatble Christmas gift.

A sleigh, a stuffed deer, and a cellophane-wrapped Potter refrigerator appear in this window to attract passersby to Weber's main entrance.

Engineers Discuss Thermal Problems, Elect New Officers of Society

(Concluded from Page 1, Column 5)

the next two years are Arnold Goelz of Kroeschell Engineering Corp., Chicago; Cyril Leech of the Mack Machine Co., Philadelphia; A. B. Stickney, consulting engineer of New York City; W. R. Woolrich, professor of mechanical engineering at the University of Tennessee, Knoxville; and John Wyllie, head of the department of sales engineering at Kelvinator Corp., Detroit.

As chairman of the membership committee, Mr. Harrison reported that 150 new members were secured in the membership drive just ended. He also advised that the special inducement in waiver of the $5 initiation fee is to be continued.

First session of the convention was held Tuesday morning with Mr. Oakley presiding. Speakers were Harry Edwards, F. D. Berkeley, and J. S. Beamensderfer. This was followed by the welcome luncheon at noon which was addressed by Prof. Walter Rautenstrauch.

Second session, that afternoon, was devoted to thermal problems, with Mr. Harrison as chairman. Speakers were Walter Fleisher, George Putnam, Prof. P. K. Bates, and A. B. Stickney.

Domestic-Commercial Practice was the topic of Thursday morning's meeting, with Mr. Stevenson in the chair. This was addressed by H. A. Whitesel, L. A. Philipp, J. G. DeRemer, and G. W. Dunham.

Thursday afternoon the group met jointly with the A.S.M.E. on air conditioning to hear the following speakers: F. G. Keyes, R. R. Sayres, and C. B. Graves. The annual banquet took place that night.

Concluding session of the convention was also devoted to air conditioning, with George Bright in the chair, and talks by F. L. Sahlmann, W. C. Goodman, and W. C. Giles.

DELEGATES

Delegates to the meetings included:

J. M. Allerdice, Brooklyn; O. A. Anderson, Chicago; W. H. Aubrey, Waynesboro, Pa.; R. W. Ayres, Schenectady, N. Y.

A. H. Baer, Carbondale, Pa.; C. A. Baker, Omaha; C. T. Baker, Atlanta; Louis Baron, New York City; P. K. Bates, Cambridge, Mass.; J. S. Beamensderfer, York, Pa.

M. F. Beardsley, Newark; C. W. Benica, Newark; J. C. Bennett, Somerville, Mass.; Stephen Bennis, New York City; J. G. Bergdoll, Jr., York, Pa.; F. D. Berkeley, New York City.

C. W. Berry, Cambridge, Mass.; Clarence Birdseye, Gloucester, Mass.; E. E. Blumerd, Philadelphia; C. W. Bohmer, Jr., New York City.

Henning Borgstedt, Bryn Mawr, Pa.; K. P. Brace, New York City; J. H. Bracken, Chicago; F. E. Burpee, Lewisburg, Pa.; L. J. Buttolph, Hoboken, N. J.

P. H. Carpenter, New York City; W. H. Carrier, Newark; C. J. Chase, New York City; C. S. Cole, New York City; Thomas Coyle, Wilmington, Del.

A. C. Craig, New York City; A. P. Craig, Sr., New York City; R. B. Crawford, Waynesboro, Pa.; S. R. Cummings, North Canton, Ohio.

Gustave Dahlman, New Britain, Conn.; W. W. Dalman, New York City; J. G. DeRemer, New York City; A. Y. Dowell, New York City.

G. W. Dunham, New York City; S. A. Durbin, New York City; W. P. Duyen, Newark.

H. D. Edwards, New York City; F. T. Elcler, New York City; E. H. Edling, Mt. Vernon, N. Y.; A. H. Eustis, Boston; John Everetts, Jr., New York City; A. W. Ewell, Worcester, Mass.

M. G. Farrar, New York City; F. H. Faust, Schenectady, N. Y.; Crosby Field, Brooklyn; R. U. Fittz, Tufts College, Mass.; E. R. Fitzgerald, Schenectady, N. Y.; J. E. Fitzsimmons, Brooklyn.

W. L. Fleisher, New York City; H. L. Forman, Kitchawan, N. Y.; E. Fowler, New York City; F. M. Fuller, Hagerstown, Md.; A. W. Furbank, Brooklyn.

Henry Galson, Edystone, Pa.; M. W. Garland, Waynesboro, Pa.; J. L. Gibson, Dayton; W. C. Giles, Marcus Hook, Pa.; John A. Goff.

W. C. Goodwin, East Pittsburgh, Pa.; J. C. Goosman, Mt. Vernon, N. Y.; J. Gottlieb, New York City; H. C. Guild, Pittsburgh.

J. E. Haines, New York City; W. R. Hainsworth, New York City; C. H. Hall, New York City; Kenneth Hamilton, New York City; Henry Hammond, Alexandria, Va.; D. R. Harper, III., Pittsburgh; H. Harrison, E. Orange, N. J.

G. W. Hart, Long Island City, N. Y.; R. P. Hawkins, Boston; Wm. Hennings, Chicago; D. P. Heath, Detroit; T. H. Herter, New York City; N. H. Hiller, Carbondale, Pa.

C. F. Holske, New York City; F. A. Horne, New York City; G. A. Horne, New York City; E. F. Hubacker, Detroit; G. E. Hulse, New Haven, Conn.; E. McK. Hunt, New York City; A. V. Hutchinson, New York City; R. M. Hyde, Detroit.

L. H. Jenks, Rutherford, N. J.; E. T. Johnson, New York City; R. P. Kehoe, New York City; W. J. King, Schenectady, N. Y.; W. L. Knaus, Schenectady, N. Y.; I. J. Knudson, Detroit.

George Lange, New York City; James Larkin, New York City; H. F. Lathrop, Fort Wayne, Ind.; F. K. Lawler, New York City.

Cyril Leech, Philadelphia; Joseph LeGrand, New York City; Frank Leopold, Alexandria, Va.; A. A. Levine, Niagara Falls, N. Y.

L. L. Lewis, Newark; Chester Lichtenberg, Fort Wayne, Ind.; D. C. Lightner, Brooklyn; Theo. Lindeman, New York City.

William McEnerney, New York City; I. E. McFarland, New York City; Curtis Main, New York City; M. A. Malone, Brooklyn; C. L. Marshall, Montclair, N. J.

J. A. Martocello, Philadelphia; Andre Merle, New York City; A. M. E. Meyerowitz, Newark; F. J. Moelter, New York City; L. S. Morse, York, Pa.; Glenn Muffly, New York City.

C. R. Neeson, New York City; K. M. Newcum, New York City; J. T. Nichols, Pittsburgh; A. W. Oakley, New York City.

E. W. O'Brien, Atlanta; G. B. Palmer, Jr., Detroit; G. H. Palmer, New York City; L. R. Parrish, New York City; H. H. Pease, Brooklyn; Gustave Petersen, New York City; L. A. Philipp, Detroit.

I. K. Polley, South Norwalk, Conn.; Gardner Poole, Boston; C. F. Pratt, Brooklyn; C. W. Presdee, New York City; G. W. Putnam, Chicago.

R. J. Quinn, New York City; A. A. Reed, Boston; C. M. Robinson, Cincinnati; C. H. Roe, New York City.

L. C. Roesel, Savannah, Ga.; L. H. Roller, Newark; W. H. Ross, New York City; Siegfried Ruppricht, New York City; E. R. Ryan, Boston.

F. L. Sahlmann, Erie, Pa.; J. T. Schaefer, Detroit; M. C. Schwartz, New York City; C. E. Shedd, Philadelphia; A. L. Smith, New York City; A. P. Smith, South Norwalk, Conn.

R. B. Smith, Scranton, Pa.; A. B. Snavely, Hershey, Pa.; P. S. Staples, New York City; A. R. Stevenson, Jr., Schenectady, N. Y.; A. B. Stickney, New York City.

F. H. Stiening, Pittsburgh; J. F. Stone, New York City; J. H. Stone, New York City; J. E. Strachan, New York City.

C. H. Tanger, Evansville, Ind.; R. H. Ten Eyck, New York City; W. M. Thomsen, South Norwalk, Conn.; W. M. Timmerman, Cleveland; Henry Torrance, New York City; R. E. Townsend, New York City.

D. R. Vanneman, New York City; Herman Vetter, Los Angeles; Weston Vogel, New York City; L. A. Volberding, Detroit; J. H. H. Voss, New York City; A. J. Vroman, New York City.

W. A. Wadsworth, New York City; D. K. Warner, Watkins Glen, N. Y.; R. W. Waterfill, Newark; G. Y. Watt, New York

F. A. Weisenbach, Philadelphia; H. A. Whitesel, Fort Wayne, Ind.; H. M. Wilkinson, New York City; H. M. Williams, Dayton; O. J. Willoughby, Atlanta; T. E. Willson, Jr., New York City.

Fremont Wilson, New York City; L. P. Wishart, Jr., Newark; J. L. Wood, New York City; W. R. Woolrich, Knoxville, City; Karl Wegemann, New York City; C. G. Weigand, Brooklyn; C. E. Weinland, Manville, N. J.

Tenn.; John Wyllie, Jr., Detroit.

M. T. Zarotschenzeff, New York City; Carlo Zorzi, New York City; F. A. Zumbro, Waynesboro, Pa.; J. R. Zwickl, Philadelphia.

Heads A.S.R.E.

A. R. STEVENSON, JR.
G-E engineer elected president of the A.S.R.E.

'Ton of Refrigeration' In the Limelight, Its Definition Is Ambiguous

(Concluded from Page 1, Column 4)

although there is need for some standardization on a quantity.

Opinion was definitely divided between the large machine makers and the small machine men on the size of the rate which should be adopted as standard.

Large machine companies insist on continuance of the word "ton" as an expression of daily rate, with the argument that it is already well known and useful. The small machine engineers prefer B.t.u.'s per hour as more accurate for shorter periods, and more suitable for small machine calculations. It can easily be increased by adopting some multiple such as 1,000, they aver.

Another faction in the meeting suggested leaving ton as the accepted expression for a rate, and adopted a new term for a quantity of 288,000 B.t.u. This new term, they suggest, might be called a Starr, in memory of John E. Starr, recently decreased past president of the society.

With respect to a standard rating for comparing capacities of various machines, considerable dissatisfaction was evident with the present 86 and 5° F., as condensing and evaporator temperatures. It was pointed out that these two temperature points were established chiefly for ice-making plants, and that with development of air conditioning and the diverse applications of commercial refrigeration, some new low side standard temperatures should be adopted.

It was suggested that there be several standard temperature conditions, one for each leading application. Thus there might be five evaporator temperatures and three condensing temperatures, the latter divided further according to water or air cooling.

THE NEWSPAPER OF THE INDUSTRY

ELECTRIC REFRIGERATION NEWS

WRITTEN TO BE READ ON ARRIVAL

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TEN CENTS PER COPY

A. WENNER-GREN MAY BUY STOCK IN SERVEL, INC.

Swedish Capitalist to be Board Chairman, 'Time' Says

NEW YORK CITY—Proposed sale of 100,000 shares of stock in Servel, Inc., to Axel Wenner-Gren of Sweden (as announced in last week's issue of ELECTRIC REFRIGERATION NEWS) is contemplated by Servel directors as a means of strengthening the company's cash position and gaining the benefits of Mr. Wenner-Gren's closer connection with the business, according to an article entitled "Electrolux Goes Home," appearing in the Dec. 18 issue of the news magazine *Time*.

The directors, *Time* says, in a communication to Servel stockholders declared that "A point has been reached in the development of the corporation's business where the proposed arrangement with Mr. Wenner-Gren will be of great benefit . . . In addition to the benefits to be derived from Mr. Wenner-Gren's closer connection . . . the proposed arrangement will strengthen its cash position."

Time also states that Mr. Wenner-Gren, who heads A. B. Elektrolux of Sweden, will be made chairman of the board of Servel, Inc.

Present stockholders will have to agree to the proposed terms at a special meeting called for Jan. 5 before the sale can be consummated. The terms of the sale give Mr. Wenner-Gren a three-year option on another 100,000 shares at slightly higher prices.

According to the news magazine account, the Swedish capitalist at one time (1926) tried to interest General Motors Corp. in manufacturing and distributing his Electrolux refrigerator in the United States. Later he sold to Servel, Inc., the U. S., Canadian, and Cuban rights. Through this deal he became Servel's largest stockholder and later a director.

GRUNOW DISTRIBUTORS HOLD DEALER RALLIES

CHICAGO—A "Grunow Week" observance featured 'dealer-salesman rallies held recently in various parts of the country under sponsorship of General Household Utilities distributors.

Dealers in Omaha, under auspices of the Sidles-Duda-Myers Co., staged the observance with special displays of Grunow radios and refrigerators.

Grunow Week was observed by the following Omaha dealers: Orchard & Wilhelm, A. Hospe Co., Schmoller & Mueller Piano Co., Union Outfitting Co., Glen A. Crancer, the Brandies Stores, and the Ed. Patton Music Co.

Duane Wanamaker, advertising manager of General Household Utilities Co., joined George S. Coit, southern district manager of the company, at two southern dealer meetings, one in Norfolk, Va., the other in Atlanta, Ga.

Approximately 100 dealers from the Norfolk area met at the Fairfax hotel, under the auspices of the Benton-Bailey Co., and heard Mr. Wanamaker and Mr. Coit discuss the line. In Atlanta the speakers presented the line to dealers and salesmen of the Peaslee-Gaulbert Corp.

With Joseph R. Good, Altoona (Pa.) Grunow dealer presiding, dealers from 14 counties gathering at Altoona's Penn Alto hotel heard George Gaidzik of the home office discuss the products and methods of consumer sales approach.

A state-wide dealer meeting was sponsored in Oklahoma City by Hughes-Bozarth-Anderson, distributor there. H. T. Stockholm of the factory was one of the speakers.

Watson & Wilson, Inc., Grunow dis-

(*Concluded on Page 4, Column 5*)

Potter Changes Name Of Company

BUFFALO—Name of the manufacturing organization of this city headed by T. Irving Potter has been changed to the Potter Refrigerator Corp., which name it had borne from its inception in 1926 until February of 1932, when the name was changed to Tricold Refrigerator Corp.

Features

NOISE REDUCTION THIS WEEK, AIR CONDITIONING NEXT

Feature article in this week's issue of the NEWS is on noise reduction in electric refrigerators—a subject which is expected to assume greater importance in 1934 sales programs. The article (on page 10) was prepared by Dr. E. J. Abbott of the University of Michigan, and describes methods of measuring and analyzing sounds of a refrigerator so that they may be reduced.

Next week the NEWS will present the most complete survey ever undertaken of existing air-conditioning installations, reporting actual progress in 12 large cities. In most cases the survey shows the number of installations and connected power load in a city on Jan. 1, 1933, and then the same for installations made through this past summer.

DOMESTIC INDUSTRIES TO BUILD 'FRIGITOP'

MANSFIELD, Ohio—Bearing the trade name "FrigiTop," a new domestic refrigerator is being introduced by Domestic Industries, Inc., of this city. Feature of the refrigerator is a separate compartment at the top of the cabinet, space in which is equally divided for vegetable crisping and bottled-beverage cooling. Entrance to this section is through a door at the top of the cabinet.

When vegetable-crisping space of this supplementary compartment is in use, there is sufficient space for storage of 12 pint bottles, according to B. J. Busch, the company's sales director. Use of the crisping space for beverage cooling doubles the compartment's bottle capacity.

First public showing of Domestic Industries' 1934 line will be made at the January furniture show in Chicago, says Mr. Busch.

KELVINATOR LAUNCHES USER GOOD-WILL DRIVE

DETROIT—Planned to increase revenue of distributors and dealers during the winter months, Kelvinator Corp.'s second Kelvinator User Good-Will campaign is being presented to selling forces throughout the country.

Free inspection of old-model Kelvinators is the basis of the campaign. Using this service call as a door opener, the serviceman has an opportunity to sell the user service on his old machine and accessories to bring it up to date.

In advance of each service call, a letter is sent to the user, informing her that a local Kelvinator man will call to give her Kelvinator a free inspection.

The serviceman inspects and ad-

(*Concluded on Page 4, Column 5*)

Issues Invitation

T. K. Quinn, vice president of General Electric Co., will have an important part in G-E's Institute dedication Friday.

Refrigeration's Role in Tuna Fishing Is Subject of A.S.R.E. Meeting

LOS ANGELES—Refrigeration and its importance in the tuna fishing industry was the subject of three speakers who addressed the December meeting of the Los Angeles section of the American Society of Refrigerating Engineers recently.

H. C. Godsil, senior fisheries researcher of the California State Fisheries Laboratory at Terminal Island, spoke first on development of the fishing industry on the Pacific Coast.

Mr. Godsil stated that in 1929, value of the catch was about $13,000,000—a 25-fold increase since 1904. Most of the development has occurred in Monterey and San Francisco, Calif. In 1929 the canneries took 92 per cent of the total catch, although they use only a half-dozen species of all those caught.

Four of these species totaled 90 per cent of the catch. In order of quantity they were sardines, Pacific mackerel, yellow-fin tuna, and skipjack. A total of 326,000 tons of sardines were caught, more than the other three species combined, yet the value was not as great as that of the yellow-fin tuna alone.

Sardines are found at different seasons of the year along the coast, said Mr. Godsil. When these fish appear at any particular point, they can be caught in quantities sufficient to supply all demands, so the boats used are small and are equipped for only short trips. Mackerel are much like sardines in this respect.

Tuna, however, must be caught at greater distances, for while the tuna canneries are located in southern California, the fishing circle for these just touches San Diego and extends thousands of miles to the south, he explained.

Tuna fishing, when launched intensively in 1926, required new investment for boats to bring the catch to market because of the great length of the trips. As the trips increased in lengths, ice refrigeration, which had always been used, soon became inadequate.

No research was made to perfect this equipment and since the fishermen were acquainted with ice refrigeration only, development was along the line of conserving the ice supply, explained Mr. Godsil.

The fish were packed in ice, and small compressors and coils helped to prevent the loss of this ice. Today a fleet consists of large boats partially insulated, carrying large amounts of ice with mechanical refrigeration for conserving the supply.

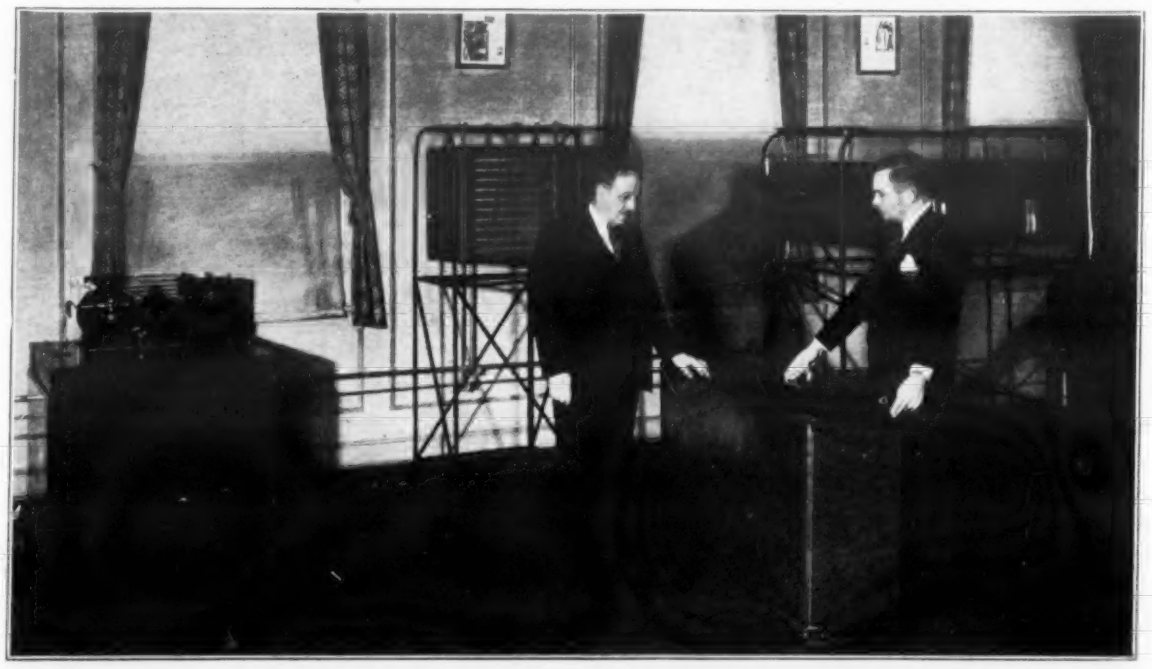
In concluding his talk, Mr. Godsil gave a brief survey of development in the foreign fishing industry. Japan is experimenting with floating factories, canning the fish at sea. Some of the catch is also frozen and shipped to this country for canning.

Most of the British experimenting is being done off the coast of Newfoundland where salmon is frozen and shipped to England. The French are conducting some miscellaneous experiments with mechanical refrigeration on a small scale.

Some of the best work on research is being done in Russia. The Russians

(*Concluded on Page 4, Column 3*)

Equipped to Battle 1934 Heat Waves



F. E. Sellman (left), vice president, and C. A. Miller, sales manager, inspect Servel's air-conditioning equipment, which was announced in last week's News.

OWEN D. YOUNG WILL DEDICATE G-E INSTITUTE

Ceremony to be Held At Nela Park Friday

CLEVELAND—The new General Electric Institute at Nela Park here, embodying the facilities and functions of the former General Electric Kitchen Institute and General Electric Lighting Institute, and housing other services, will be formally dedicated at ceremonies to be held Friday, Dec. 22.

Owen D. Young, chairman of the board of the General Electric Co., will give the dedicatory address at the formal opening. His address will be broadcast over a nation-wide NBC network of 50 radio stations, between 7:45 and 8 p. m.

Designed largely as a testing and proving ground, the new institute is so staffed and equipped as to lend itself with equal facility to a few hours' tour of inspection or an intensive course of study. Besides serving as a demonstration and testing laboratory for new advances in lighting and home management, it functions as a clearing house for information, as well as a training school for sales representatives and others who become service directors for dealers, distributors, and public utilities.

In the spring of this year, Nela Park, original home of the incandescent lamp department, became the headquarters of the electric refrigeration and specialty appliance sales departments of General Electric Co.

The institute's 22,000 sq. ft. of floor space houses a wide variety of electrical exhibits and demonstrations. The institute is under the co-directorship of L. C. Kent and Paul H. Dow.

Invitations to the dedication have been issued by Vice Presidents T. K. Quinn for the refrigeration department and T. W. Freck for the incandescent lamp department.

75-TON COOLING JOB ORDERED BY KRESGE

DETROIT, Dec. 19.—S. S. Kresge Co. announced today the letting of contracts to Conditioned Air Corp. of Detroit for the air conditioning of its No. 1 Detroit store at 1201 Woodward Ave. A total of 75 tons of refrigeration, to be supplied by Universal Cooler Corp., will be employed in the installation.

Air cooling will be accomplished by the direct expansion of Freon in Trane coils. Air distribution will be through a central system in which ducts will be used to carry the air to the basement and main floor, which are to be air conditioned.

Six 12½-ton Universal Cooler condensing units will be installed. Each unit will be individually operated by means of thermostatic controls. Delayed starting equipment will be utilized to prevent an excessive load being thrown on the line.

KELVINATOR WILL HOLD NINE REGIONAL MEETINGS

DETROIT—Nine regional meetings will be held by Kelvinator executives during the first three weeks of January to acquaint distributors' wholesale men with sales plans for 1934.

Two crews will conduct the meetings. Heading the eastern crew will be R. I. Petrie, sales manager, accompanied by A. H. Reinach, in charge of national user sales. They will hold meetings in Pittsburgh, Jan. 2 and 3; Philadelphia, Jan. 4 and 5; Boston, Jan. 8 and 9; and New York City, Jan. 11 and 12.

Vance C. Woodcox, director of advertising and sales promotion, and J. A. Harlan, commercial sales manager, will conduct the western swing, beginning their series with a meeting in Detroit on Jan. 2 and 3. Their other meetings are scheduled for Chicago, Jan. 4 and 5; Kansas City, Jan. 8 and 9; Dallas, Jan. 11 and 12; and Atlanta, Jan. 15 and 16.

Both household and commercial refrigeration plans for the coming year will be discussed.

R. M. Hyde of McCord demonstrates how handy the McCord "Easy-Out" ice cube tray can be.

C. H. Tanger, Servel engineer, relaxes with his favorite business newspaper.

J. T. Collins is now general manager of Frigidaire's New York, New Jersey, and Albany districts.

Con Eakin, New York City Frigidaire chief, lands an order by telephone after getting a tip from the News.

A. H. Eustis of Virginia Smelting looks with satisfaction upon his exhibit at Chemical Industries Exposition in New York.

BY GEORGE F. TAUBENECK - - -

J. T. Collins Joins Frigidaire

One of General Motors' most able sales executives, J. T. COLLINS, has a new job. He's now general manager in charge of the New York, New Jersey, and Albany districts for Frigidaire.

For 20 years Mr. Collins has been with General Motors. He has been general sales manager of Oldsmobile, and was a B-O-P (Buick-Oldsmobile-Pontiac) executive.

We met him in New York recently, and were impressed considerably. He is, we should judge, a "heavyweight."

CON EAKIN continues in charge of New York operations, while GEORGE F. BRADY heads the New Jersey district, and WALTER B. COAKE is in the driver's seat at Albany.

M. F. McCARTHY, who used to be Frigidaire's assistant general service manager, is now in charge of service and installations for the three districts.

KEITH L. SAUNDERS, formerly eastern representative for the department store division (under CHARLEY LAWSON of Dayton) is now wholesale manager in New York, replacing F. G. SCHLEGEL, resigned.

Other New York branch appointments include:

JOHN E. LIEBENDERFER, manager of retail stores, and G. R. THOMPSON, his first assistant.

M. E. CUTLER, manager of quantity sales.

M. ANNAPOLIN, commercial sales manager.

A. E. LARRABEE, manager of the air-conditioning department.

JOHN D. WELCH, comptroller.

* * *

How to Find Ted Quinn

If you should call on TED QUINN some day in his new office in the General Electric building, here's a tip:

Don't knock at the door marked T. K. QUINN. That, apparently, ain't it.

Last Friday morning we had a 10 o'clock appointment with Mr. Quinn. At 9:55 we entered an elevator in the General Electric building, and in a jiffy were whisked up to a high floor.

(There was just one other passenger in that elevator, incidentally, and he was OWEN D. YOUNG! All the way up he studied intently a partially worked crossword puzzle.)

Confronting us were three offices, a hallway, and a G-E water cooler. One of the frosted-glass doors was marked:

T. K. QUINN

Next to it was a door labelled:

C. W. STUART
J. M. WALKER

At the "T. K. QUINN" door we knocked. No response. We tried opening it, and found it locked. So we waited.

Sixteen minutes later, a secretary came out of the "Stuart-Walker" door, saw how forlorn and lonely we looked, and asked us if anything could be done.

And in a jiffy we were ushered through the "Stuart-Walker" door into the presence of Mr. Quinn.

With the aid of a G-E photoflood lamp, we got a dandy picture of General Electric's youngest vice president, which is reproduced on page 1 of this issue.

* * *

Seeing the Shows With the ASRE

Despite the fact that Repeal Night was the eve of the midwinter ASRE conclave, and that celebrating the renewal of oldtime friendships in the good old-fashioned masculine manner had become legal and patriotic, instead of criminal and *sub rosa*, ASRE men didn't make a lot of trips to the dogs during their New York sojourn.

Rather, they went to the theater on such evenings as they could spare from arguments over air conditioning.

Because the New York stage this season presents an exceptionally fine choice of meritorious entertainment, and because the verdicts of the accredited critics may not always help men of this particular industry find shows which will please them, we offer below our own guide to shows which readers of this paper should enjoy (compiled after a poll of ASRE convention theater-goers):

Best all-around show—"Roberta," the Jerome Kern-Otto Harbach musical comedy.

Funniest play—"She Loves Me Not," with "Sailor Beware" second, and "Her Master's Voice" third.

Funniest revue—"As Thousands Cheer."

Plays "truest to life"—"Ah, Wilderness!" and "Growing Pains."

Finest acting—George M. Cohan in "Ah, Wilderness!" Helen Menken in "Mary of Scotland," Tamara in "Roberta."

Funniest acting — Victor Moore (Alexander Throttlebottom) in "Let 'Em Eat Cake," Lyda Roberti in "Roberta," Roland Young and Laura Hope Crews in "Her Master's Voice," Clifton Webb in "As Thousands Cheer" (particularly his impersonation of John D. Rockefeller, Sr. getting Radio City for a birthday present), and Polly Walters in "She Loves Me Not."

Best singing—George Meader in "Champagne, Sec," Raymond Middleton, William Hain, and Tamara in "Roberta," Ethel Waters in "As Thousands Cheer."

Worst singing—Marilyn Miller in "As Thousands Cheer."

Best dancing—Clifton Webb in "As Thousands Cheer," Harriet Hoctor in "Hold Your Horses," Paul Haakon and Elenore Tennis in "Champagne, Sec."

Worst dancing—Buzz Jones in "She Loves Me Not."

Loveliest principals—Peggy Conklin in "The Pursuit of Happiness," Jean Arthur in "The Curtain Rises," Florence Rice (daughter of sportswriter Grantland Rice) in "She Loves Me Not," Tamara in "Roberta," Elenore Tennis in "Champagne, Sec."

Handsomest principals—Tonio Selwart in "The Pursuit of Happiness," William Hain in "Roberta," Fred Keating in "All Good Americans."

Prettiest girls—"Let 'Em Eat Cake."

Homeliest girls—Earl Carroll's "Murder at the Vanities."

Special Note: CHARLES D. BROWN, who plays the realistic press agent in "She Loves Me Not," is a combination—in appearance, actions, and speech—of FRED BOLLMEYER and RAY BAKER of the Maxon, Inc., advertising agency.

* * *

Jack North Honored

One event the writer is sorry he missed was the dinner given last Wednesday in Cleveland to JACK NORTH of the Cleveland Electric Illuminating Co. and guiding genius of the famed Electrical League of Cleveland.

Jack had won the James H. McGraw Medal for cooperation in the electrical industry (C. E. MICHEL of St. Louis won a similar award), and a group of his Cleveland friends foregathered to pay him tribute. R. J. STRITTMATTER, vice president in charge of sales for Apex, was the leading spirit in promoting the dinner.

Around the industry it is pretty generally agreed that Jack (don't ever make the mistake of going formal and calling him "John"—his name is Jack) is the dean of cooperative electrical endeavor in American cities. The dinner he richly deserved.

He is a fine, white-haired gentleman who could harmonize and fraternize a collection of Nazis, Zionists, and Sinn Feiners—if he had the job to do.

Again, sorry we couldn't attend the dinner!

* * *

In the Morning's Mail

JIM IRWIN, Frigidaire publicity director who is having himself a time on the Frigidaire schooner, *Seth Parker*, on which the eminent radio philosopher, PHILIPPS LORD, is sailing around the world, drops us a line from Boston, where the *Seth Parker* had just been greeted by fireboats, tugs, harbor passenger craft, Mayor JAMES M. CURLEY, and a fine crew of Frigidaire notables, including President E. G. BIECHLER, Vice Presidents H. W. NEWELL and E. R. GODFREY, and JOHN S. PFEIL, New England manager.

"Boy," writes Jim, "is ERN getting snooty?

"Pretty swell for a trade pub to have its own quarters and bachelor apartments for the single members of the staff. I expect to be bowed in by a slant-eyed manservant on my next call.

"Next to a penthouse above a Fifth Ave. office location, I would call your new setup perfect."

We agree.

GIL BAIRD, a Fuller and Smith advertising man (working on the Westinghouse account), wonders about the dressing room picture of ELENORE TENNIS, one of the stars in "Champagne, Sec," which appears on page 4 of the Dec. 6 issue of the NEWS.

"Was it," he asks, "made through the keyhole, through the transom, or was the editor ACTUALLY IN THE ROOM with the charming young lady, and if so WHAT WAS HE DOING THERE?"

Gil ought to know by this time that if an editor can't get in any place he wants to, he's no editor. Incidentally, note the picture (taken in the same fashion) of LYDA ROBERTI, movie queen and headliner of the current Broadway musical show, "Roberta," on this page.

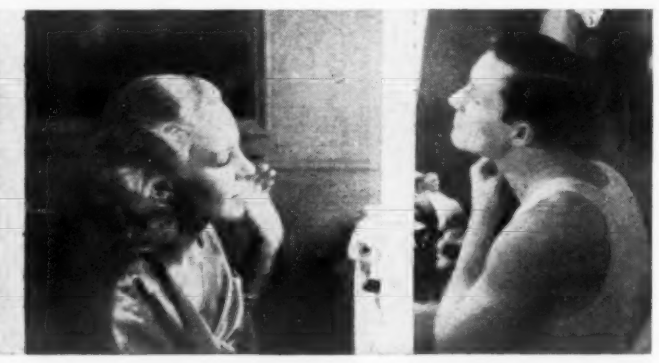
From Dartnell Publications comes a letter signed by EGUENE WHITMORE, editor of *The American Salesman*, enclosing a clipping from the explanatory caption under the picture referred to by Mr. Baird, and asking three brief questions, which we'll answer right here and now for the benefit of other camera fans:

What lens opening? 2.8.

What kind of film? Eastman supersensitive panchromatic.

How much time? One-fifth of a second.

Al Smith and wife. Utilizing only the mazda glare of Broadway, this snapshot was taken at night "on the sidewalks of New York."



Lyda Roberti and Raymond Middleton photographed in their dressing rooms after a performance of "Roberta," in which they are starred. Miss Roberti you have seen in movies.

Snapshots taken from the audience during performances of the shows mentioned above: (1) Lyda Roberti as a bride in "Roberta"; (2) Lyda again—hoydenish this time; (3) John Beal, of "Another Language" fame, plays for Grantland Rice's lovely daughter, Florence, in "She Loves Me Not"; (4) Polly Walters, who causes all the ruckus in "She Loves Me Not," showing how she disrupted the tranquility of Priceton university; (5) the musical director of "Champagne, Sec." leads his cast in a rousing chorus of a Johann Straus song.

Scenes from the political travesty, "Let 'Em Eat Cake" (sequel to the Pulitzer prize-winning "Of Thee I Sing"): (1) Labor agitators on Union Square; (2) Dictator Wintergreen (Billy Gaxton) and Vice President Throttlebottom (Victor Moore) ponder the state of the nation; (3) the League of Nations plays the U. S. Supreme Court a baseball game to decide whether they shall pay double or nothing on the war debts: Umpire Throttlebottom prays for guidance; (4) members of the Union League Club listen for rumblings of the revolution.

It's easier to sell what they want than to argue

It's a lot easier to sell people what they want than to try to argue them into taking something "just as good." Yes, and it's not only easier but more profitable, too.

And that applies with particular force to the selling of electric refrigeration equipment.

Think it over.

It isn't just due to chance that there are a million more Frigidaires in use than any other electric refrigerator. Neither is it due to chance that Frigidaire's sales in 1933 have shown such a remarkable increase.

More people *want* Frigidaire—that's all.

And to you as a dealer that means just one thing. It means that it's a lot more profitable to *sell* Frigidaire than to try to unsell prospects who have already made up their minds.

We believe that it will pay you to get in touch with us before you shape your plans for 1934. Frigidaire Corporation, Subsidiary of General Motors Corporation, Dayton, Ohio.

Frigidaire

A GENERAL MOTORS VALUE

Mechanical Refrigeration in Tuna Boats Offers Problems

(Concluded from Page 1, Column 4)

work methodically and design special equipment for the problem, after making careful surveys, stated Mr. Godsil.

Second speaker, J. H. Holroyd of the Union Ice Co., described a cruise which he took on the tuna clipper *Mayflower* to obtain data on temperature conditions in the refrigerated hold during a cruise.

"The *Mayflower*, one of the newer boats for tuna fishing, is of the raised-deck type. It is 135 ft. long, has a 28-ft. beam, a 15-ft. draft, and is equipped with a 550-hp. main engine and a 75-hp. auxiliary engine," he began.

"In developing the present tuna fleet, a need was found for something other than gasoline as a fuel and so the Diesel engine was utilized.

Supplies for 90 Days

"In equipping for a trip, supplies and food are carried for 90 days. This is to make sure that the center of the fishing grounds may be reached which may be as much as 2,500 miles south. Total cost of supplies for such a trip is about $4,000."

Crew of the *Mayflower* consisted of a captain, a radioman, an engineer, the cook, and 14 fishermen. The first stop was made in Magdalena Bay, where live bait was caught. The Mexican government charges a fee of about $400 per year for the privilege of taking live bait there, Mr. Holroyd explained.

The *Mayflower* carried four bait tanks, two on deck and two in the hold. Altogether 2,000 scoops of sardines, about 1,500 gallons, were taken aboard. For more than a day, the boat was moored in order that the fish might orient themselves.

Gradually, said the speaker, they began to move in a circular direction around the tanks, which circular motion is maintained throughout the trip. If this orientation were not accomplished, the fish would damage themselves by running into the sides of the tanks. When this circular movement has been obtained, a light is burned in the tanks every night so the fish may see where they are going.

On Mr. Holroyd's trip, the destination was a point about 1,500 miles south of San Diego. The first afternoon of fishing, between 8 and 10 tons of tuna were caught.

Bait 'Churns' Tuna

"As the boat approaches the school," he said, "motors are shut off and a man stationed on the bait tanks 'churns' the tuna by throwing bait overboard. The bait, as soon as it hits the water, turns and swims back toward the boat with the tuna following.

"The men fish with bamboo poles about 8 ft. long, 2 in. in diameter at the butt, and 1 in. in diameter at the tip. No reel is attached, but only a ¼-in. cord to the end of which is a short wire leader and a barbless hook or squid.

Fish from Platforms

"They fish from platforms below the side of the boat, and swing the fish up onto the deck where the hook is immediately released. The men work one pole or else two or three poles together, each pole handled by one man, depending on the size of the fish.

"Usually the smaller ones come first, then the larger, and a great scrambling occurs when the tackle must be changed. In two- or three-pole fishing, the line converges to a ring from which point the single line runs to the leader."

60-Ton Capacity

One-pole tuna run from 7½ to about 50 lbs., two-pole from 50 to 90 lbs., and three-pole from 90 to 150 lbs., Mr. Holroyd explained. Fish are generally not taken above 150 lbs. because the canneries are not able to process them.

"About 60 tons of tuna can be piled in the limited space on the deck if the sea is calm. In rough weather, anything over 40 tons will be lost over the sides when the ship rolls," he continued.

"If the above quantities can be taken at one time, fishing must stop till the fish are stowed away in the hold. The tuna are packed solidly in the hold, first a layer of fish and then a layer of ice, then another layer of fish until the entire hold is solid. Refrigeration equipment is then operated till the boat reaches port."

Refrigerating Equipment

J. N. Berger then described the refrigerating equipment used on the *Mayflower*. The early equipment, he said, was ice only. As the refrigerating equipment was installed after the boat was built, the installation was a particularly difficult one, because, as in the case of most boats, practically all available space was already utilized

In this case, the unit was electrically driven, though usually no electrical energy is available and refrigerating units must be driven by the main engine when the boat is moving and by the auxiliary engine while fishing or at anchor.

Little or no insulation is applied to the fishing boats—making the refrigeration problem almost a guess. After the hold has been filled with fish, the hatches are battoned down and no one looks into the hold till the boat reaches port.

Crowd Space with Coils

According to Mr. Berger, the only way to refrigerate such a boat is to crowd all the available space with coils and then to pick a unit size which will handle the amount of coil installed.

Originally, coils were placed on all the upper surfaces but heat cavities were then found in the pack which caused much of the load to spoil. The vertical sides were next coiled, and lastly, coils were laid down through the pack itself which helped greatly.

In refrigerating the *Mayflower*, 3 in. of cork were applied to the skin of the ship, then an inner liner, then the coils, then a series of slats to keep the fish from coming in contact with the coils. A total of 4,150 ft. of 1¼-in. pipe was installed, using a 10-ton refrigerating unit and hand-operated expansion valves.

ROSS SELLS 13 NORGES IN 1 MORNING

KANSAS CITY, Mo.—E. J. Ross, salesman for the Kansas City Power & Light Co. here, recently sold 13 Norge refrigerators in a single Saturday morning, according to officials of the utility.

COONLEY IS RE-ELECTED PRESIDENT OF AMERICAN STANDARDS ASSOCIATION

NEW YORK CITY—Re-election of Howard Coonley to presidency of the American Standards Association for 1934 was announced at the annual meeting of the association at the Hotel Astor Dec. 13. Mr. Coonley is the president of the Walworth Co. here.

F. E. Moskovics, chairman of the board of the Marmon-Herrington Co. of Indianapolis, was also re-elected to the vice presidency of the organization.

J. C. Irwin, representing the American Railway Association, and F. M. Farmer, representing the American Society for Testing Materials, were elected to the chairmanship and vice chairmanship, respectively, of the Standards Council of the association.

PRODUCTS MUST APPEAL TO WOMEN, SAYS BLOOD

DETROIT—Discussing the necessity for giving various products an appeal to the woman buyer, Howard E. Blood, president of Norge Corp., makes the following statements in a recent issue of *Sales Management*:

"Better than 2,000 000 women cast their votes at the shopping centers of American business every day. They control the purchase of 62 per cent of all hardware, 85 per cent of all drugs and sundries, 90 per cent of all automobiles, 98 per cent of all household appliances, 97 per cent of all groceries, 77 per cent of all sporting goods, and actually 61 per cent of all men's furnishings.

"Feminine influence is the big factor in all successful electric refrigeration merchandising."

500 ATTEND OPENING OF G-E STORE IN NORWICH

NORWICH, Conn.—Earl G. Taggart has opened a new General Electric appliance store at 331 Main St. here. More than 500 townspeople attended the formal opening of the new showroom.

Mr. Taggart had formerly been appliance sales manager of the Norwich Gas & Electrical Co. Associated with him in his new venture will be Robert Storms, also formerly connected with the utility's appliance sales department, and Miss Marjorie Wheeler, who will conduct home service demonstrations.

G-E Kitchen, Furnace In Modern Home

OMAHA—A G-E all-electric kitchen and a G-E oil furnace form part of the equipment in the "House of Tomorrow" which was erected here under the sponsorship of the Junior Chamber of Commerce of Omaha.

The model home was erected to "stimulate sales, increase employment, encourage home building, and disseminate progressive architectural ideas."

Equipment in the kitchen of the home includes a G-E refrigerator, range, and dishwasher. Storz Electric Refrigeration Co., Omaha distributor, made the installation.

Snarey Promotes Sales For Detroit Firm

PORT HURON, Mich.—E. B. Snarey, director of purchases for some years past at Mueller Brass Co. here, has resigned his position to join the Central Steel & Wire Co. in Detroit, in charge of the promotion of nonferrous products.

Grunow Distributors Hold Meetings

(Concluded from Page 1, Column 1)

tributor in southern California and Arizona, sponsored a meeting for 250 dealers in Los Angeles to introduce the Grunow radio line.

Speakers included James J. Davin, sales promotion manager for General Household, W. E. Darden, Pacific Coast manager of the company, and W. E. Wilson, vice president and general manager of the distributorship.

Kelvinator Builds Users' Goodwill

(Concluded from Page 1, Column 2)

justs the refrigerator, suggests necessary repairs, endeavors to sell accessories, leaves a complimentary Kelvinator recipe book, and secures names of prospects.

It is recommended by the factory service department that servicemen receive commissions on accessory sales and bonuses for prospects sold during the campaign period.

3 RESTAURANTS AND MARKET EQUIPPED WITH G-E MACHINES

MILWAUKEE — E. H. Schaefer Corp., General Electric distributor here, has recently finished three large installations of commercial refrigeration equipment for restaurants and one large meat market job, according to E. V. Oakwood, commercial sales manager for the distributorship.

The Wrigley restaurant has been equipped with refrigeration for water cooling, food storage, ice cream storage, salad pans, and butter and milk refrigerators. G-E "conditioned-air" units are being used in the storage boxes. Other equipment refrigerated consists of 20 ft. of specially constructed salad pans, three ice cream cabinets, and three butter and milk boxes. Units handling this job include 3-hp., 2-hp., and ¾-hp. compressors.

The Steuben restaurant has been equipped with refrigeration for water cooling, food storage, salad pans, and a tap room. Three compressors are used on this job.

The Monticello hotel's tap room has been equipped with G-E beer-cooling equipment.

Anton Mogolich's meat market has installed an 8x15-ft. storage cooler, 24 ft. of G-E "conditioned-air" display case, and a refrigerated window. Two large compressors are used on this installation.

GEORGIA HALL INSTALLS KELVINATOR EQUIPMENT

WARM SPRINGS, Ga.—The Warm Springs Foundation here, of which President Roosevelt is one of the patrons, has purchased a $3,000 installation of refrigeration equipment for its new building, Georgia Hall.

Kelvinator equipment was installed, the sale being made by G. L. McWilliams, commercial salesman for the Columbus division of the Georgia Power Co.

Equipment installed consists of a cook's refrigerator and a pantry refrigerator, both built by the Shannen Refrigerator Co. of Atlanta; and a dairy refrigerator, meat storage refrigerator, and low-temperature room for frozen products, all built by the Georgia Power Co. with the assistance of the Mundet Cork Corp.

A Kelvinator 2-hp. condensing unit and four specially built sets of Larkin coils furnish the refrigeration for the installation.

DEALER LING OPENS NEW GLEN FALLS G-E STORE

GLEN FALLS, N. Y.—Formal opening of a new store at 29 Ridge St. operated by H. C. Ling, General Electric dealer in specialty appliances and air-conditioning equipment, was attended by hundreds of townspeople and officials of A. Wayne Merriam, Inc., General Electric distributor in Schenectady.

In the center of the new store and display room, with the short wing against the wall, is a standard G-E kitchen display, complete with range, dishwasher, and refrigerator. Also on display is an air-conditioning unit and G-E oil furnace.

A feature of the operation of the store, according to Mr. Ling, will be Sunday night suppers served in the all-electric display kitchen.

G-E Prepares Mailing Pieces for Markets

CLEVELAND—Two new mailing pieces designed for use by a new food store user of General Electric "conditioned-air" commercial refrigeration equipment, to announce to his customers that he has just purchased new food protection, is being distributed to dealers selling G-E commercial equipment.

Salesmen will use this mailing series as additional ammunition in their selling activities.

G-E Equipment Placed In Chicago Tavern

CHICAGO—Ye Old English Tavern here has just installed a G-E "conditioned air" refrigerator to preserve its foods, according to Lou Kohlman of R. Cooper Jr., Inc., Chicago G-E distributor. With the refrigerator is a CMF-6W condensing unit.

MILK COOLERS INSTALLED BY BRECKENRIDGE

SPRINGFIELD, Mass.—For milk-cooling purposes, a CM-8W 2-hp. condensing unit operating a brine tank and coils has been installed in the Lavole Dairy at Ludlow, Mass., by Breckenridge, Inc., General Electric distributor here.

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Preparing for Better Business in 1934

ELECTRIC refrigeration manufacturers are apparently looking to 1934 for the biggest business in their history. A review of various items in issues of ELECTRIC REFRIGERATION NEWS for the past several months may give some clue to the brightness of their expectations for next year.

Recently, Westinghouse Electric & Mfg. Co. in Mansfield, Ohio, completed a huge brick-and-steel warehouse for storage of refrigerators, ranges, and small appliances. It is being stocked now to insure prompt deliveries to distributors during the coming season. Said Refrigeration Manager R. C. Cosgrove to Westinghouse field men late in September: "Next year, we'll build 150,000 refrigerators, and we're planning all our sales activities with an aim toward selling a minimum of 125,000."

Late in September, General Electric Co. announced formation of a new division in its specialty appliance sales department to concentrate its attention on building up retail sales.

To Norge Corp.'s Muskegon (Mich.) plant, a 10,000-sq. ft. addition is being made, and at the company's headquarters in Detroit, construction is nearing completion on a sizable extension of office space. Six weeks ago, Norge Sales Manager John H. Knapp announced that the company has set aside for 1934 the largest advertising appropriation in its history. In the last few months, it has added a dozen or more men to its engineering staff, and is setting up a home service department.

Extension of the Electrolux plant of Servel, Inc., at Evansville, Ind., was started Nov. 1 to increase 1934 production facilities, and the Electrolux research laboratories, formerly located in New York City, are being moved to Evansville to speed up production activities. First of this month, Servel opened a new lunchroom and recreation hall for its employes. Last month, General Household Utilities Co. acquired a third plant in Chicago—bringing the number of its plants to four, one being in Marion, Ind.

Two commercial equipment manufacturers, too, are planning for extension of their operations. In San Antonio, the Ed. Friedrich Co. recently added a new porcelain plant to its factory, while the Allied Store Utilities Co. in St. Louis is acquiring a new building to increase its production facilities.

A number of manufacturers have established branch offices lately. Last month, Bush Mfg. Co. of Hartford, Conn., opened a branch in New York City. Fedders Mfg. Co. has put a Chicago branch in operation. The Young Spring & Wire Co., Detroit refrigerator shelf manufacturer, also started a Chicago branch several months ago. Another company to open a New York City branch recently was Allied Store Utilities Co.

Several weeks ago, Bush Mfg. Co. established an assembly plant in Chicago to fabricate evaporators. In the same city, Liquid Carbonic Corp. opened a downtown sales office, Seeger's factory branch was moved to larger quarters, and General Electric Co. opened a showroom in the Merchandise Mart to display its electrical appliances to household furnishings buyers.

From many sources comes information that manufacturers' plans for next year call for production greater than that of 1933. Suppliers, particularly, say that manufacturers are "thinking and talking in terms of larger production." A review of the above "expansion items" seems to indicate that manufacturers have for some time been making plans, that they are providing themselves with ample facilities to *work with*—that they expect business to be good in 1934.

Justifiable Delay

DISTRIBUTORS and dealers to a considerable extent are pretty much in the dark about what their manufacturers will do in 1934. These selling men understand that their home office men are planning to set new highs in production next year, as indicated in the other editorial on this page, but in a good many instances, that is just about all they have heard from headquarters.

Only a small number of manufacturers have shown their new products, the number of distributor meetings held to date is small, very few distributors have been given any definite information on what their 1934 quotas will be, and field organizations have heard little or nothing about 1934 merchandising plans and campaigns.

Distributors believe that a good deal of their companies' delay in announcing new lines and sales plans has been caused by the rush of the season just past. Business continued in such good volume after the record-setting summer season that there has been little time for sales and production executives to get into a huddle and call signals for the coming year.

Fortunately, however, stocks in factory warehouses and in the field are comparatively low. Last year, a number of manufacturing organizations were all set with products and plans well in advance of the new season, but were delayed in announcing them because of large stocks on hand.

Now, field selling organizations know that as soon as 1934 lines are in production and factory selling programs are completed, there should be nothing to keep them from making an immediate attack on the 1934 refrigeration market.

WHAT OTHERS SAY

OUTCASTS UNDER THE CODE

RETAILERS of electrical appliances awake to find themselves outcasts under the code. Because there is no national association that can speak for a majority of the dealers who sell electrical equipment, they have no standing in the administration of the retail code. Electrical merchandise cannot be represented on the compliance boards in the cities. The electrical trade must seek expression through the department stores and hardware merchants, who have recognition because they are organized.

Now the electrical specialty shops today sell perhaps 35 per cent of the domestic appliances, the contractor-dealer 8 per cent, and the power company merchandising departments 20 per cent. They have felt in the past that they did not see eye to eye in all matters of policy with the department stores and hardware men, who sell, say, 18 and 5 per cent respectively. To these non-electrical stores this household equipment of ours is just one line of merchandise to be sold at a profit. But the electrical man is keenly interested in the development of the electrical market. Certainly with the power company this is the dominating objective. Therefore there is growing concern over the situation.

Out of the NRA compliance boards it looks as though there will evolve in every city some sort of a council of retail merchants which will police local trade practices in the public interest. Since the electrical appliance dealers are denied the seat they naturally desire in this council, because they cannot speak as an organized group, the need has come for a national association of electrical dealers. With it they can take their place with the national organized hardware, department store, automobile accessory, drug, and other trades in the more orderly self-government of their business. They can have that voice in the regulation of their own affairs to which they are entitled if they will qualify.

The simplest way to proceed would seem to be to use the membership of the local electrical leagues or associations now operating in 112 or more cities as the nucleus of a national association of electrical dealers and build on that. It is to be hoped that some action to this end may be initiated at the meeting of the National Electrical League Council soon to be held.—*Electrical World*, Dec. 2, 1933.

Formula for Adequate Refrigeration In Food Stores Given in Food News

By Phil B. Redeker

HOW much refrigerated equipment does a retail food market need? That is a question which often confronts salesmen of commercial refrigeration equipment, and one which very few are prepared to answer.

One solution to the problem of the amount of refrigerator equipment needed for various types and sizes of food stores appears in the December issue of REFRIGERATED FOOD NEWS. The article is based upon the conclusions of two prominent sales executives of commercial refrigerator manufacturing companies.

Repeal of the 18th amendment has opened a new field to commercial refrigeration, and REFRIGERATED FOOD NEWS devotes a news story to the explanation of what that market is. Results of a survey made in the restaurant and hotel field are given, and important data on the proper method of preserving wines and champagnes are presented.

Another front page story in the current issue of REFRIGERATED FOOD NEWS is one which relates that the code proposed for the restaurant industry makes mandatory the installation of proper refrigeration equipment.

The December issue contains many news articles which give concrete evidence of the advantages to be gained with modern refrigeration equipment. The following headlines give a clue to the contents of the stories: "Community Store & Warehouse Saves $100 Monthly with New Units"; "Retailer Who Puts Desire for 'Change' Into Effect Finds It Helps Business"; "Modern Equipment Simplifies Selling"; "Restaurant Uses Space Efficiently"; "Refrigerated Display Boosts Bakery Sales"; "Packer Distributes by Modern Trucks."

A food retailer who is able to build a good-sized sales volume on cheese items builds his profits in proportion, as cheese is a long-profit item. What refrigerated display of cheese will mean to a retailer is told in a story which quotes rules for successful cheese merchandising set forth by a leading cheese manufacturer.

Much has been done to advance the art of serving and cooling the beer since the brew was legalized last spring. D. C. Seitz, chief engineer of the Russ Mfg. Co., has done considerable experimental work in the relationship between the pressure and temperature conditions in keeping beer, and he tells about his findings in the December issue.

Why lower temperatures must be held in a small store cooler in which cut meats are kept is explained in a study made by the Food Investigation Board of the United Kingdom, which story appears under the heading "Small Commercial Coolers Must Hold Low Temperatures."

For those refrigerating engineers and service men who are interested in the operation of large ammonia plants, the article "Two-Stage Compression Proves Aid to Ice Cream Plant Operation" by P. T. Lealey, mechanical engineer of the Reid Ice Cream Corp., New York City, offers much information of a practical nature.

The construction and installation of low-temperature display equipment for ice cream products and frozen foods present a number of special problems. Gardner Poole, vice president of the Birdseye Packing Co., who has made an intensive study of the problem of preserving and displaying foods at a low temperature tells what kind of evaporators and temperature controls are best suited for this work.

The super food market with its elaborate outlay of refrigerated equipment is no longer a novelty in larger metropolitan areas; when it starts to take its place in the smaller towns, however, it is news. The December issue of REFRIGERATED FOOD NEWS tells with story and picture the manner in which a super market has been set up in Westfield, N. J., a town of 16,000 population.

SOUTHERN WESTINGHOUSE DISTRIBUTORS CONVENE

MEMPHIS, Tenn. — Westinghouse distributors and dealers from the southeastern and southwestern districts met here last week to study domestic and commercial refrigeration and other electrical appliances manufactured by Westinghouse Electric & Mfg. Co.

G. F. Leake, manager of the Memphis branch of the factory organization, and E. A. McDermott, manager of Westinghouse Electric Supply Co. here, were hosts at the meeting, which was the last of three sponsored by Westinghouse for exchange of merchandising ideas.

L. K. Baxter, service manager from the company's plant at Mansfield, Ohio, was in charge of the meeting.

GRUNOW APPOINTS 2 NEW DISTRIBUTORS FOR RADIOS

CHICAGO—Two Grunow distributors have been franchised by General Household Utilities Co. to sell Grunow radios in new territories.

Peaslee-Gaulbert Corp., handling Grunow products in the Atlanta (Ga.) and Louisville (Ky.) areas, has taken over the radio line for the Jacksonville, Fla., area.

Orgill Brothers, Grunow refrigerator distributor in the Memphis, Tenn., territory has taken over the radio distributorship in Jackson, Miss.

Servel Used to Develop X-Ray Films

CHICAGO — Servel commercial equipment has just been installed in the Billings Memorial hospital here for use in connection with development of X-ray films.

A Servel 30-DW compressor with a special coil cools the large tank of water used in the developing process. The unit is located next to the X-ray room.

MUELLER LICENSES CRANE TO MAKE VALVES

PORT HURON, Mich.—Negotiations have just been completed between Crane Co. of Chicago and Mueller Brass Co. licensing the Crane Co. to manufacture streamline fittings for the plumbing and heating field which Crane serves. Mueller's business in streamline copper pipe and fittings is now 50 per cent ahead of the same period in 1932, the announcement states.

BRIGGS TO PROMOTE SALES FOR N. Y. MAJESTIC

NEW YORK CITY—F. Worth Briggs has been appointed sales promotion manager of Majestic-New York, Inc., distributor of Majestic refrigerators and radios here.

'Grunow Fantastique'

Tom Sheehy, prominent dancing master, uses a Grunow radio with remote control "Si-Lec-Trol" in teaching these young pupils.

HOME SERVICE

Home Economists Report on Current Consumption of Refrigerators

Editor's note: The following test to determine current consumption of an electric refrigerator under varying conditions of operation, carried out by Dr. Greta Gray, associate professor of home economics at the University of California, Los Angeles, and Dorothy Glasgow, in charge of home economics at the Elsinore, Calif., high school, is reprinted in full from the June-July, 1933 issue of the Journal of Home Economics.

THE consumption of current by two refrigerators in use in the department of home economics at the University of California at Los Angeles was observed over a period of 10 months for the purpose of discovering how much the cost of operation is influenced by the temperature maintained, the load stored, the frequency with which the box is opened, and the making of ice cubes and frozen desserts.

The refrigerators were two models of Frigidaire: model AP-18 with 18 cu. ft. of storage space, and model AP-6 with 6 cu. ft. The larger box had four doors, the smaller, one. The coils and the compressors in the two models also differed in design.

Location of Refrigerators

Presumably, however, the refrigerators were equal in general quality and the differences were those necessitated by the size. They had been in use about four months when the observations began.

One refrigerator stood in a storeroom and the other in a laboratory, but the two rooms were similar in shape and size (about 175 sq. ft. of floor area), each had a window to the east, and neither contained a source of heat. Each refrigerator stood in a northwest corner against inside walls in which there were no heat ducts or pipes. The temperature of the building is controlled by thermostats.

Maximum and minimum thermometer readings made just above the refrigerators never ranged beyond 60° and 80° F. and with few exceptions were between 65° and 75° F.

As the refrigerators were in regular use by classes, the experimental work had to be fitted in as best it could. During vacations, examination periods, and on Saturdays and Sundays the loads and the opening of the refrigerators could be controlled, but when classes were in session these conditions varied greatly according to the nature of the laboratory work being done; the students were likely to open the doors many times a day and frequently used the boxes to cool hot food.

As may be seen in Table 1, 0.154 kilowatt hours of current were consumed per hour by the large refrigerator operating under "school conditions."

Tests were made to determine what controlled conditions would lead to a similar consumption, and it was found that 0.151 kilowatt hours per hour or 3,624 kilowatt hours per day was used when the box had a load of 60 lbs., of which 12 lbs. were replaced daily by new materials at room temperature, and when the doors were left wide open for two 5-minute periods during the day.

In all the tests on which this finding was based the temperature on the floor of the refrigerator below the cooling unit was maintained at 30° F. and the materials were stored in a way to allow a good circulation of air.

After trying different ways of defrosting, the method of putting hot water in the ice cube pans was adopted because when it was used the temperature of the refrigerator (shown by a Tycos recording thermometer) remained for a shorter time above what it was set to maintain than with any other method.

Ordinarily the refrigerators were defrosted every three weeks, but sometimes the defrosting was done earlier in order to get them into the desired condition for a vacation period, and occasionally they were allowed to run four weeks without defrosting.

Since the amount of frost on the coils influences current consumption care was taken to make comparisons of consumption only for periods that were equally distant from the days of defrosting.

Table 1 shows the average current consumption of the two refrigerators under varying conditions of operation. The readings for empty and unopened boxes are averages from three-week periods, each beginning on the day of defrosting. Those for school conditions are averages from four-, three-, or less than three-week periods, each beginning on the day of defrosting; their combined duration is more than 900 hours.

The temperature maintained in the larger box was 15° F. lower than that in the smaller one. Both when the boxes were empty and unopened and when they were utilized under school conditions, the larger one consumed about twice as much current as the smaller.

However, if the comparisons are made on the basis of cubic feet of storage space the smaller one is found to consume over 60 per cent more current than the larger. This difference may be in small part due to difference in design, but the principal explanation is that two bodies of similar shape and composition but of different size absorb or lose heat at different rates, heat loss or absorption being proportional to the surface rather than to the mass. The small refrigerator has a larger surface in proportion to its mass than the large one has.

Table 1 also shows that operating the large refrigerator under school conditions consumed 48 per cent more current than operating it empty and unopened, and that for the small refrigerator the corresponding increase was 44 per cent.

Current Consumption

Table 2 shows the current consumption of the large refrigerator under different conditions of operation. It gives average figures for all the periods between 9 and 16 days after defrosting during which the refrigerator was operated under the stated conditions and includes two series of tests, one in which the temperature maintained under the cooling unit was 30° F. and one in which this was 27° F.

The table indicates that the load in the refrigerator increased consumption by about 21 per cent in both series. The increases in consumption under school conditions over those for empty and unopened are 32 per cent and 54 per cent. Door openings of the loaded refrigerator thus increased the consumption by 11 per cent in one of these series of tests and 33 per cent in the other.

Evidently there was a minimum of door opening in the first series, for the 0.137 kilowatt hours consumed per hour under school conditions here is considerably lower than 0.154 kilowatt hours per hour given in Table 1 as the average for all periods during which this refrigerator was operated under school conditions at a temperature of 30° F.

From the figures in Table 2 it is calculated that dropping the temperature 3° F., from 30° F. to 27° F., caused an increase in current consumption of about 20 per cent when the box was either empty and unopened or loaded and unopened. A similar comparison could not be made for school conditions because the latter varied too greatly in these two series of tests.

Table 3 shows the current required for making ice cubes of water at a temperature of 63° F. when introduced into the freezing compartment. For the larger refrigerator this is about 0.18 kilowatt hours per quart of water, and for the smaller one about 0.19 kilowatt hours.

The tests made to show current consumed in freezing desserts or other foods were too limited for tabulation. They tend to indicate that freezing ices requires more current than making ice cubes, presumably because the sugar and other substances in the former depress the freezing point.

They also indicate that less current is required to freeze a mousse than to make ice cubes presumably because mousse has a high percentage of fat which is solid at a comparatively high temperature and also because its bulk is comprised largely of the air beaten into it.

In general the study shows that the way in which a refrigerator is used plays a large part in the cost of its operation. Keeping the temperature of the interior unnecessarily low means a waste of current; for example, a drop of 3° F. occasioned 20 per cent increase in current consumed.

Opening the door and loading the box with material to be cooled also increases consumption. With great care, the increase due to door opening and load may be kept down to 25 or 30 per cent above that of the empty, unopened refrigerator; under ordinary conditions of use in the home economics department laboratory it averaged 45 per cent and in one series of tests it was 54 per cent.

The extra current required to freeze ice cubes was found to be roughly 0.2 kilowatt hours per quart of water at 63° F.; the extra current required for freezing desserts and other foods would presumably vary somewhat with the composition of the material but would probably not be far from that required for freezing water.

TABLE 1

Average current consumption of refrigerators under two conditions of operation

Size of Refrigerator	Temperature maintained on floor of refrigerator under cooling unit °F.	Empty and unopened* Consumption per day kw. hr.	Consumption per hour kw. hr.	Daily consumption per cu. ft. of storage space kw. hr.	School conditions, including making of ice cubes† Consumption per day kw. hr.	Consumption per hour kw. hr.	Daily consumption per cu. ft. of storage space kw. hr.
Large	39	2.496	0.104	0.138	3.700	0.154	0.205
Small	45	1.368	0.057	0.218	1.970	0.082	0.328

*Records for three-week periods, beginning on the day of defrosting.
†Records for periods of four, three, and less than three weeks each beginning on the day of defrosting.

TABLE 2

Average hourly current consumption of the large refrigerator under several conditions of operation over periods extending from the ninth to the sixteenth day after defrosting

Temperature maintained on floor of refrigerator under cooling unit °F.	Empty and unopened (a) kw. hr.	Loaded and unopened kw. hr.	Loaded and unopened Percentage increase over (a)	School conditions without making of ice cubes kw. hr.	School conditions without making of ice cubes Percentage increase over (a)
30	0.104	0.127	22	0.137	32
27	0.125	0.151	21	0.193	54

TABLE 3

Average current consumed for making ice cubes from water at 63° F. in empty, unopened refrigerators over three-week periods beginning on the day of defrosting

Size of Refrigerator	Temperature maintained on floor of refrigerator under cooling unit °F.	Amount of water frozen qt.	Current consumption per day: No water frozen kw. hr.	Ice cubes made once kw. hr.	Increase for making ice cubes kw. hr.	Increase per quart of water frozen kw. hr.
Large	27	8	2.952	4.392	1.440	0.180
Small	45	2	1.368	1.752	0.384	0.192

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New Research Shows How to Measure Noise in Electric Refrigerators

Noises Can Be Measured with Sound Meters, And Analyzed into Reducible Components

By Dr. E. J. Abbott, Research Physicist
Department of Engineering Research, University of Michigan

GREAT strides have been made in the past few years in the reduction of noises in mechanical refrigerators. The first electric refrigerators were such a great improvement over the ice box that matters such as rapid freezing, quietness, and similar refinements were not much stressed, but with the rapid growth of the industry such points have become important. Early moves in noise reduction were comparatively obvious and the results were marked. Spring and rubber mountings, quieter motors, and closer manufacturing tolerances in compressors and other moving parts brought about much quieter units.

Notwithstanding this valuable work the noise of present day refrigerators is still very audible, not only in the kitchen, but also to a considerable extent in other parts of the house, particularly in bedrooms during the quiet hours of the night when sleep does not come as it should, and all sounds seem particularly designed to keep the hearer awake.

The next moves to be made in quieting are not so obvious. Additional flexible mounting seems to do little good, motor manufacturers point out that quieter motors are going to be much more costly, and production departments groan at the thought of closer manufacturing tolerances.

None of the various experiments tried seem to have very much effect and it is hard to know just where in this apparently well tramped field the next improvements are to be made.

The answer seems to be very clear cut; advances will be made with the aid of noise measuring instruments. Suppose the problem were one of reducing weight, and no scales were available so that weights were estimated by lifting the machines.

Or suppose that the problem were thermal, and that no thermometers or thermocouples were available so that temperatures had to be determined by feeling with the hand, or seeing if a match would burst into flame.

Such procedures seem absurd, but they are no more so than the prevalent practice of trying to solve noise problems with the usual ear listening.

After all, sound consists of fluctuations in the atmospheric pressure, and the physical quantities of sound are as definite as those of weight and temperature, and can be measured with suitable instruments.

While such physical measurements form the basis of all instrumental sound studies, they are in themselves of slight practical value. The important question is, "How do these pressure variations affect the average human ear?" In other words, "What is the human sensation?"

Fortunately, we now have considerable information on this important psychological problem, and with the aid of these data, the physical sound measurements can be interpreted in terms of the sensation they will produce in average human ears.

If the need for sound measurement had become acute in the refrigerator industry a dozen years ago, little could have been done about it, because suitable instruments for measuring sound pressures were not available, nor had the necessary information concerning human hearing been obtained so that the physical data could be applied in a practical way.

Within the past few years there have been great advances, both in the field of measuring instruments, and in the matter of data on hearing, and still further in the application of such instruments and data to practical problems of noise reduction.

As a result, means are now available so that one can attack noise problems directly and definitely with assurance that arguments can be eliminated by measurement, the importance of the various factors evaluated, and the progress at any point stated numerically.

This material is so new that it has not found its way into books, technical curricula, or our general background of engineering experience to any extent. Since many of the fundamentals of sound and hearing are so unusual and so contrary to our ordinary ideas on the subject, it is the purpose of this paper to outline a few of the fundamentals of instrumental sound studies, with particular reference to refrigerator noise problems.

Procedure in Typical Refrigerator Noise Reduction Problem

To illustrate how sound measurements can be used in noise reduction problems, a hypothetical problem of noise reduction will be outlined in some detail.

The first step is to measure the "total noise" of a group of complete refrigerators of the same type to determine their initial noise level for future reference, and to learn something about the sample to sample variations which occur in the product.

The "total-noise" meter measures all the components of the sound simultaneously, the instrument being adjusted so that it weighs the various components in the same manner that the human ear does for pure tones of approximately the same level as the sounds being measured.[1]

Checks against a number of actual observers show that the readings of such a meter agree very closely with the loudness as judged by a group of observers.[2] As outlined in the section of this article on instruments and technique, these measurements are preferably made in a sound chamber so that variations due to wave patterns can be averaged out.

Let us assume that total-noise measurements on a group of refrigerators yield the following data:

TABLE 1—INITIAL "TOTAL NOISE" OF A GROUP OF MACHINES

Machine	"Total Noise" Decibels[3]
1	44
2	45
3	45
4	46
5	46
6	48
7	49
8	50
9	50
10	52

The first five machines of this group might be rated as comparatively quiet, while the last five were selected to represent the various kinds of noisy machines. Tests must also be made to determine the effects of ambient temperature, load, portion of cycle of operation, and other variables which affect the noise.

The next step is to determine the relative importance of the various sources of noise in one or more of the machines. The most satisfactory way of doing this is to run the various parts one at a time and to measure the contribution of each part.

Obviously, this can not always be done, but with some ingenuity and use of motors outside the test chamber which drive through quiet shafts, etc., a great deal can be done in this way. Suppose that Table 2 gives the results of such a test.

Such "part by part" tests are of slight value if the loudness is judged by ear instead of being measured by meter. This is due chiefly to the peculiar manner in which the ear "adds up" loudness components. The human ear cannot be depended to hold limits closer than 5 or 10 decibels even for a few minutes.

On the other hand, if one has three equally loud sounds occurring simultaneously, the combined "total noise" is only 4.8 db. above any one of them singly, and only 1.8 db. above a combination of two of them together.

Therefore, if there are several components of approximately the same loudness, the change in the "total noise" due to the introduction or removal of any component part of the sound is small compared to the uncertainties of ear judgments.

While the presence or absence of any component of the sound may have little effect on the *total noise*, it ordinarily does result in a noticeable difference in the *quality* of the sound. This change in quality may or may not be important, but in any case it does add to the difficulty of trying to compare the relative loudness by ear.

We find by test that observers do not feel very certain about comparing the loudness of sounds of different quality, and that individuals vary greatly in making such loudness balances.

Consequently, any single observer may not agree very well with the average of a group of observers, although the meter does agree with such an average with surprising accuracy.[4]

From the above discussion it will readily appear that no important reductions in total noise can be made unless the loudest component is reduced, and that even the complete removal of the loudest component will have little effect if there still remain one or more components which were nearly as loud as the one removed.

Because of this very fundamental fact, a vast amount of effort and expense has been wasted in making large reductions in component parts of the sound which produced little effect in the total noise.

TABLE 2—NOISES OF THE VARIOUS PARTS OF MACHINE 10 MEASURED SEPARATELY

	Decibels	Corresponding Energy[4] Ergs per sec. per sq. cm.
Motor	46.5	$45 \div 10^6$ "
Fan	47.4	55 "
Compressor	46.0	40 "
Fan & Compressor	48.5	70 "
Fan & Motor	50.2	105 "
Motor & Compressor	49.4	86 "
Total Noise	**52.0**	**158 "**

From Table 2 it is very obvious what must be done, and in noise reduction work such knowledge is often more than half the battle. In this hypothetical machine (the data are purely for illustration and do not apply to any particular model), the fan noise must be reduced, because removing the compressor altogether would reduce the total noise by less than 1½ db. and removing both the motor and compressor would reduce it only 3½ db.

It is also to be noted that the fan makes considerably more noise when it is assembled with the condenser, and that the fan and motor together make more noise than would be expected from their individual measurements.

This indicates that the fan serves to radiate some of the motor noise better than it is radiated from the motor alone. On the other hand, the combined noise of the motor and compressor is just what would be expected, indicating that the noise from these parts is not influenced by the combination.

In making part by part tests it is important to check up on these influences of assembly.

Suppose that we wish to reduce the total noise of this unit to 45 db. and also to have none of the sounds especially prominent. This could be accomplished by a combination such as that shown in Table 3. This would be a very noticeable reduction. Tests show that the average observer would rate this as a 40 per cent reduction in loudness.[5]

TABLE 3—NOISES OF VARIOUS PARTS AFTER QUIETING

	Decibels	Energy Ergs per sec. per sq. cm.	Reduction (Decibels)
Motor	40.0	$10 \div 10^6$	6.0
Fan	40.4	11 "	7.0
Compressor	39.5	9 "	5.5
Fan and Motor	43.2	21 "	7.0
Fan and Condenser	41.1	13 "	7.4
Motor and Compressor	42.8	19 "	6.6
Total Noise	**45**	**31.6 "**	**7.0**

From data in Table 3 it appears that in order to bring about a 7 db. reduction in the total noise, it will be necessary to reduce the largest component (the fan in this hypothetical case) by 7 db. and also to reduce the motor and compressor noise by about 6 db.

If one of the noises had been much larger than any of the others, say 10 db. or more, a considerable reduction could have been obtained by working on it alone.

The problem is now simmered down to making certain reductions in each of the component noises. Here again we turn to noise measuring instruments to lead the way. The total-noise meter has taken us about as far as it can and we next apply the analyzing noise meter.

The analyzing noise meter usually consists of a special circuit which can be used in conjunction with the total-noise meter to measure the component frequencies of any complex tone.

It has a tuning dial much like a radio, and by this means the instrument can be tuned from one audio frequency note to another much as a radio is tuned from one station to another, and the various individual component frequencies of a sound can be measured separately.

This gives another set of data much like Table 2, except that instead of listing the loudness of the various parts of the machine, it gives the various component notes of the sound of one of the parts of the machine. For example, Fig. 1 shows the results of the analysis such as might be obtained from a typical motor.

The data of Fig. 1 (on the next page) have been weighed according to data on ears so that they show the relative loudness of the various notes as they appear to the average ear, not simply the physical amplitudes.

Here again the procedure is the same as when dealing with the different noise-producing parts of the ma-

(Continued on Page 11, Column 1)

From the Author

Engineering Editor:

In this paper I have attempted to outline the noise problem in refrigerators in terms of measurable quantities demonstrated to you at the Nov. 20 meeting of the Detroit section of the American Society of Refrigerating Engineers, and to indicate definitely how sound meters can be applied to these problems.

A hypothetical case of noise reduction is carried through, and the rather peculiar interpretation of results necessitated by the characteristics of the human ear pointed out.

Originally, I had intended to follow rather closely the material given at the meeting, but after reading your very able report, that appeared to be undesirable repetition. By the way, allow me to congratulate you on the report of that meeting, it was the best synopsis of a group of technical talks that I have ever encountered.

E. J. ABBOTT.

[1] "Direct Comparison of Loudness of Pure Tones," B. A. Kingsbury, Phys. Rev., April, 1927, p. 588. Revised data in "Proposed Standards for Noise Measurement," A.S.A. Report, Acous. Jour., October, 1933, p. 110.

[2] "Sound Measurements Versus Observers' Judgments of Loudness," P. H. Geiger and E. J. Abbott, Electrical Engineering, December, 1933, page 809.

[3] While the amount of energy associated with a sound is very minute, the range of energy to which the human ear can respond is astonishingly large. If the faintest audible sound is increased until it becomes painfully loud, the increase in energy is more than million million fold.

In dealing with such large ranges it is very convenient to use logarithmic units, and the decibel is such a unit. Technically, it is defined as

$$\text{db.} = 10 \log \frac{E}{E_0}$$

Where E is the energy of the sound in question.

Where E_0 is the energy of a reference level of sound, usually taken as the faintest sound which the average ear can detect.

db. represents the number of decibels of the given sound above the reference level.

Practically, the decibel represents about the smallest change of loudness which the average ear can detect, and 10 db. represents approximately a change which the average observer rates as "half as loud" or "twice as loud." Most of the available soundmeters are calibrated in decibels.

[4] Ordinarily the combined energy of two or more sounds is obtained by adding the individual energies. Since the corresponding decibel level involves logarithms, the differences in the decibel column at first appear peculiar. These can easily be checked out by application of the formula of Note 3 to the data of Table 2. E_0 was taken as $1/10^{16}$ ergs per sec. (10 to minus 16th power watts) per sq. cm. of wave in accordance with latest threshold determination of the Bell Telephone Laboratories.

[5] "Estimation of Fractional Loudness," P. H. Geiger and F. A. Firestone, Acoustical Journal, July, 1933, page 25.

DR. ABBOTT EXPLAINS ANALYSIS OF SOUNDS

(*Continued from Page 10, Column 5*)

chine. If any appreciable reduction is to be obtained, the loudest note must be reduced. Also, this reduction will be of little value if other notes of approximately the same value still remain.

Such an analysis gives the frequency of each of the various notes and this information is very valuable in determining the part responsible for the noise. Usually the notes are harmonics of rotation, torque pulsation, stator or rotor slot frequency, gear tooth contact, or similar elements of mechanism.

Often the important notes are not the fundamental frequencies of such movements, but higher harmonics such as the fifth or eighth multiple of the fundamental operation. In other cases the important notes are found to be resonances, or critical frequencies of some of the parts.

This knowledge of exactly what frequencies are important usually locates the responsible part very definitely and something of the nature of the defect, so that moves for improvement are definitely indicated.

If efforts have been made to eliminate prominent notes it often happens that a large part of the sound consists of "unpitched sound" which has no definite frequency and which cannot be shown on a chart like Fig. 1.

Indeed, more or less of this unpitched sound is present in most machinery noise, even if there are also prominent musical notes. Certain sounds, such as windage and the like, are almost entirely unpitched sound.

The amount of the unpitched sound can be determined by measuring the total-noise and subtracting from this the energy of the musical notes as determined by analysis. Often it is found that the unpitched sound is limited to certain bands of frequencies of low, medium, or high pitch and this can be determined by suitable analyzing equipment.

Another valuable use of analyzing sound meters is in the study of notes which may be very prominent even though they do not contribute appreciably to the total noise. The ear has a marvelous ability to listen to a given sound in the presence of other much louder sounds.

Expressed in decibels, the ear can distinguish a note which lies 20 db. below the existing total noise and, if one is listening for it, a note which is 10 db. below the existing total noise may sound prominent and become very disagreeable.

Such notes would contribute less than one-tenth of a decibel to the total noise and, hence, could not be studied at all with a total-noise meter. Of course, the analyzing meter can also be used to study the noise of the complete machine if desired.

Obviously, it is impossible to describe in this article just what quieting moves should be made after the sound measurements have been taken. This will depend upon the particular problem at hand and the ingenuity of the investigator.

As stated above, it has been our experience that a knowledge of just what the noises are and what causes them is more than half the battle, and means of reducing the noise always suggest themselves after this information is obtained. Often the results are very contrary to original ideas and theories based on ear listening.

When the various individual parts have been quieted by the necessary amount, the process is checked by running the various combinations of parts to determine the changes of noise brought about by the combination, and finally the completed units are measured to check the over-all reductions.

Instruments and Technique of Sound Measurement

In view of the complexities of sound measurement and the newness of this type of work, this article would be hardly complete without a few words on instruments and technique.

Frequency Analysis of a Motor

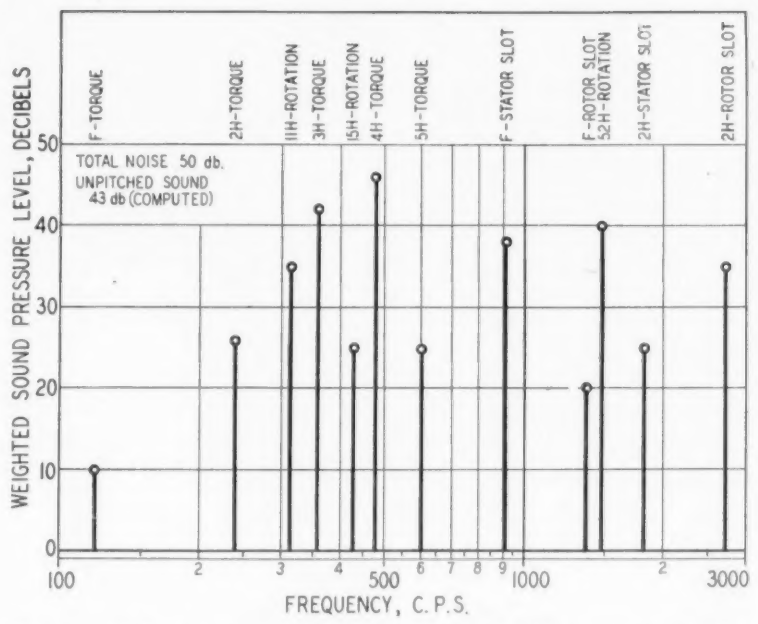


Fig. 1—Results of frequency analysis of a hypothetical motor, analyzing the component notes of its noise.

Successful noise reduction based on instrumental measurements obviously depends entirely upon the obtaining of sufficiently accurate measurements. If sounds can be well separated so that only the important ones are being measured, an accuracy of a decibel or two, or even three, might be satisfactory. However, this is a very unusual case.

Nearly always one is interested in components which are prominent but do not add much to the total noise. This usually comes about through the necessity of measuring changes in a combination in order to determine the contributions of the various parts, or it may be due to the presence of a click, whistle, or whine which is disagreeable though not as loud as other sounds present.

For this reason it is very often necessary to take measurements closer than a decibel, perhaps to tenths of a decibel.

Unfortunately, many sound meters are not capable of taking measurements accurate to a decibel or less. Sound meters in general consist of two parts; the microphone which changes the acoustical pressure vibrations to electrical voltage vibrations, and the electrical system by means of which these voltages are amplified, weighed, analyzed, and measured.

The characteristics of the electrical circuits can be measured fairly readily by the experimenter if he wishes and their calibration checked and maintained with reasonable facility.

The microphone is another matter. Microphone calibration is a difficult and complicated procedure and very few laboratories are equipped to do such work, much less the ordinary user of sound-measuring equipment.

Consequently, the user of sound meters must depend upon his microphone to maintain its calibration and to arrange to have it calibrated occasionally. It has been suggested that a sound meter can be checked by comparing its readings with the investigator's threshold (i.e., the faintest sound that he can hear), but tests show that this is liable to introduce variations of the order of 20 decibels.

It has also been suggested that loudspeaker units of various types might be used as microphones and that the uncertainties resulting from irregularities in their characteristics were relatively negligible compared to standing waves, reflections, etc.

This is like saying that because different temperatures are encountered in different places, one might just as well use a thermometer whose calibration varies by 20 or 30 degrees.

Frequency-response curves of loudspeakers usually show closely-spaced peaks and valleys of the order of 10 to 20 db. and measurements indicate that these peaks and valleys shift quite markedly with temperature, humidity, barometric pressure, and similar factors. Even the best of microphones show these variations to some extent.

With these facts in mind it can readily be appreciated that measurements taken with an uncalibrated microphone are of slight practical value because one cannot tell which sounds or components are actually louder.

All users of sound meters should insist on having occasional calibrations of the particular microphone they are using and to avoid using any instrument whose calibration is not known, and to be skeptical of calibration curves which appear to have been drawn with a straight edge.

The paragraph above mentions one

(*Concluded on Page 12, Column 1*)

DESCRIBES PROBLEM OF WAVE PATTERNS

(*Concluded from Page 11, Column 5*)

of the most troublesome features of sound measurements, namely wave patterns. It is an unfortunate fact that machines do not vibrate as a unit, but in comparatively small segments.

The surface of a machine may be likened to the surface of the sea in a storm. All points do not rise and fall together, but some are going up while nearby ones are going down and vice versa.

Each of these vibrating segments sends out its own train of sound waves and these various waves add together at some points and tend to cancel at others so that the sound is liable to vary greatly from point to point. This condition is usually aggravated by sound waves reflected from nearby objects.

As a result of these patterns, the sound at any single point near a machine is not a good measure of the noise of the machine, even when comparing different units of the same type. This difficulty is not due to the measuring instrument, but to the nature of the sound itself, and an observer experiences the same difficulty when listening by ear.

The solution is to average out the effect, not to use inaccurate instruments. Fig. 2 shows a rapid means of accomplishing this averaging which has been a very valuable aid to the work of our laboratory.

The machine to be measured is placed in a room with hard walls which produces large wave patterns. These patterns are continually shifted by a sheet iron reflector and the microphone is carried around a circular path several feet in diameter.

A slowly responding indicator meter is used in order to average out the short time variations caused by these

To Average Wave Patterns

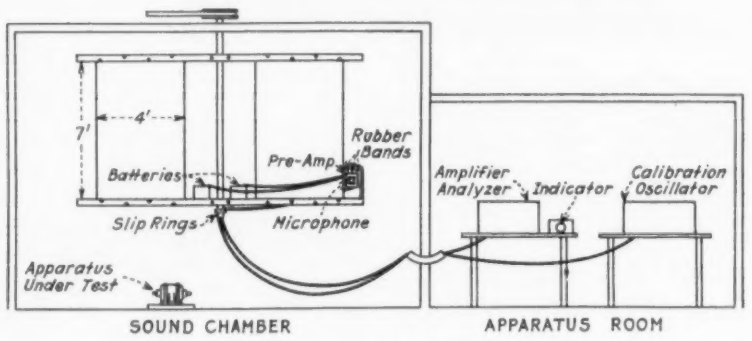


Fig. 2—Method used at the University of Michigan to average out wave patterns, see description above.

movements and an average value thus obtained. Measurements taken in this way can ordinarily be repeated to within a few tenths of a decibel. Fig. 3 shows a photograph of this chamber.

Conclusion

Noise problems are often complicated, but many of the difficulties are inherent in the nature of the sound and affect both meter measuring and ear listening alike. In addition to this there are three fundamental drawbacks to testing by ear.

First, numerical data is not obtained; second, it is next to impossible for the ear to "hold limits"; third, there are comparatively large differences between individuals so that the judgment of any single observer may not be very representative.

This last factor is closely related to the marvelous ability of the human to hear comparatively faint sounds in the presence of other louder sounds, so that different individuals are often listening to different things even though their ability to hear may be about the same.

This often is entirely unconscious and it is very difficult indeed to describe to another the part of a sound to which one is listening. These difficulties can all be overcome with the aid of suitable measuring instruments.

The procedure in noise studies with the aid of sound meters varies with the complexities of individual problems, but in general the method is to determine the relative importance of the various sources of sound, the parts responsible, the frequencies involved, and the general composition of the sound.

In this work it has been our experience that both total-noise meters and analyzing meters are essential. These

Sound Chamber

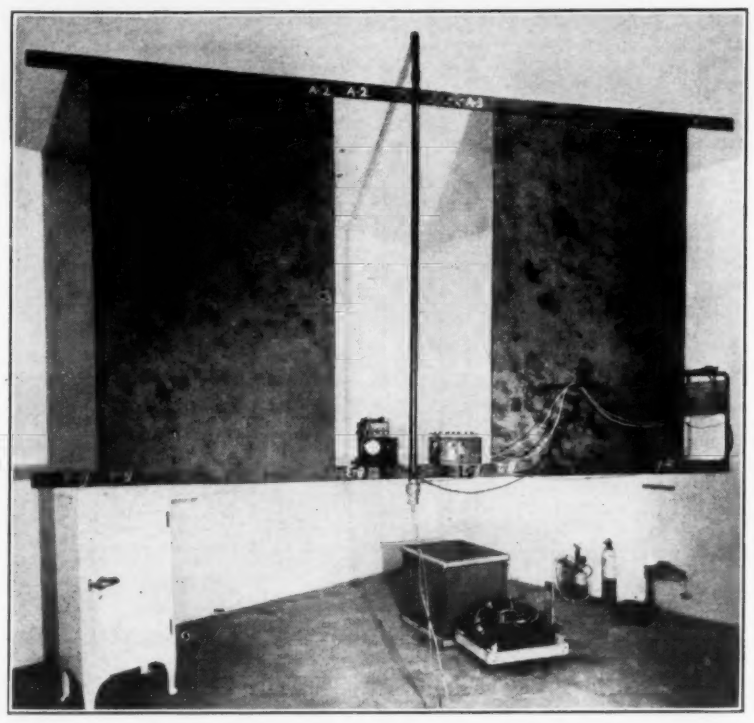


Fig. 3—View inside the sound chamber showing revolving reflector.

data usually indicate clearly what parts must be worked upon, how much reduction is required in each part or note in order to obtain a given result, and often some idea of the form of this change.

In general, quieter machines are not necessarily more expensive or more accurate. A practical quieting job ordinarily does not consist primarily of adding additional parts nor of setting closer tolerances on present ones.

The proper method is to work out changes in design or construction which will bring about the desired results without adding to the cost of construction.

Care must be taken to obtain measuring instruments which will actually yield the desired information, tests must be planned with an appreciation of the factors involved, and the data interpreted in terms of information on the relation between the physical sound pressure and the way it sounds to human ears.

If this is done, problems of noise reduction can be attacked with the aid of instruments with confidence and assurance.

The general procedure and methods outlined above have been in active use in our laboratory for the past seven years in connection with studies of machinery noises of all kinds, ranging from fractional horsepower motors to 5,000-hp. gear units, and from refrigerators to automobiles.

In every case, we have been able to make definite measurements of the noises which it was desired to study and have been able to use this information in bringing about noise reductions.

60,000 VISIT CALIFORNIA AIR-CONDITIONED HOUSE

LOS ANGELES — Sixty thousand persons visited an air-conditioned California red-wood cottage shown at the Pomona Fair, one of the big events of this section. With a total attendance of 200,000 the figures show that more than a third of the visitors inspected the cottage, equipped with Frigidaire air conditioning.

A vertical-type conditioner was installed in the living room. The cottage was all redwood construction, with 2x4 studding and using redwood bark for insulation.

Broadbent to Manage Westinghouse Dept.

PITTSBURGH—Harold S. Broadbent has been appointed manager, and DeNyse W. Atwater assistant manager of the Westinghouse commercial engineering department, according to A. E. Allen, vice president of the Westinghouse Lamp Co.

The promotions come simultaneously with appointment of Samuel G. Hibben as director of lighting for Westinghouse. Messrs. Broadbent and Atwater were assistants to Mr. Hibben during the 15 years he was manager of commercial engineering.

Pennsylvania, Central To Cool More Cars

NEW YORK CITY—Pennsylvania railroad is to bring the total of its air-conditioned cars to 700, and New York Central lines will also increase the number of its cooled coaches, according to an announcement of plans for next summer made Dec. 8 by the railroads.

SERVICE NOTES

By K. M. Newcum

Moisture in the Methyl System

MOISTURE presents a different problem in the methyl system, or any of the systems using a similar refrigerant. Moisture enters the system in about the same manner as with SO_2, except that the low side of the methyl system under ordinary conditions will operate with a low side pressure above that of the atmosphere. Possibilities of moisture entering through a leak in the low side are remote.

Moisture in the methyl system does not tend to unite with the refrigerant to combine a destructive chemical, affecting the parts of the system to any great extent. It will, however, form a glassy coating over the highly polished surfaces of the valve parts, which has a tendency to result in leaks.

Carried with Refrigerant

The bulk of the moisture will be carried around through the system with the refrigerant. While the moisture is on the high side of the system it will be liquid. When the moisture is admitted to the low side, it freezes to form ice. It melts again as it leaves the cold evaporator to return with the heat laden gases to the compressor to repeat its cycle.

The usual indication of moisture in the methyl system is an irregular expansion valve operation, evident on the gauges as an irregular, or uneven operating back pressure. Where the moisture content is sufficient, the water will freeze at the needle and seat of the refrigerant control, completely restricting the flow of refrigerant to the evaporator.

Removal of Restriction

The restriction will remain until such time as the temperature of the needle and seat will have increased to above the freezing point of water. The operating back pressure will drop to a high vacuum if the compressor is allowed to operate.

When the temperature has increased allowing the ice to melt, the pressure will usually blow the water on through the evaporator, and the back pressure will rise with the fresh supply of refrigerant to low side of the system.

The water may not be removed from the opening, but may immediately freeze again at the needle and seat, causing the back pressure to reduce steadily until the water melts, and the condition is repeated.

Use of Drying Agent

Unlike SO_2 systems, the moisture may be easily removed from the methyl system, by application of a dehydrator which is filled with a drying agent and placed in the liquid line of the system. The dehydrator, or drier, as it is commonly called, is a metal tube of either iron or brass, filled with a moisture absorbing material, fortified with closely woven wire mesh screens, and usually accompanied by felt pads or glass wool.

This assembly is capped on either end, and provided with suitable fittings for connection in the liquid line of the system. As the liquid refrigerant circulates through the dehydrator, the absorbing substance absorbs moisture, thus supplying dry refrigerant and refrigerant oil to the refrigerant control and the evaporator.

Calcium Chloride

The drying agent generally used is calcium chloride, being highly effective, reasonable in price, and obtainable at common sources. Calcium chloride may be purchased at any refrigeration supply house, or from the druggist. The drier may also be purchased from the supply house, or may be made in the shop.

A 10-in. piece of 1¼-in iron or brass pipe threaded on both ends may be used. Two or three fine screens should be placed at each end. A felt pad should be in the drier ahead of the screens. The calcium should be in flake form, if obtainable, and not in powder form.

The ends of the tube may be fitted with reducing couplings, from 1¼ in. to ⅜ in. Three-eighth-in. pipe to ¼-in. flare fittings should be inserted in the openings in the couplings. These parts should be made up with pure white lead, leak proof. The fittings should be capped immediately after charging the drier, otherwise it will absorb moisture from the air and become ineffective as a dehydrator in the job.

Placed in Liquid Line

The most effective way to use the dehydrator is to install it in the liquid line near the receiver shut-off valve, using a line shut-off valve between the liquid line proper and the drier, and a short length of copper tubing between the drier and the receiver shut-off valve.

After placing the drier in the system, the line valve should be closed and all other valves opened to their respective operating positions. The line valve should be opened slightly (cracked) allowing a slight flow of liquid refrigerant to pass through the drying agent.

By restricting the flow at this point, the drying agent will have sufficient time to absorb the moisture, and the refrigerant control will not receive sufficient wet refrigerant to cause it to freeze shut while dehydrating the system.

Freezing in Evaporator

In cases where the moisture content is excessive, the refrigerant control may persist in freezing, thus interrupting the flow through that part. This part of the system may be kept warm, by playing the flame of the blow torch around the point in question.

The evaporator should be kept at a temperature above the freezing point of water, for if it is below freezing a part of the moisture will remain frozen to the walls of the evaporator, and will not be removed by the process of dehydration, and will cause a similar condition at some later date.

The calcium chloride drier should be allowed to remain in the system for several hours with the line valve restricted. After that time the valve may be opened and the system allowed to function for the purpose of checking with the gauges. If the system operates normally the drier should be removed immediately.

Use of Calcium Oxide

If there is still some indication of moisture the drier may be left in the system until the following day. It should not be left any longer than two days.

If at the end of two days the system still shows remote signs of moisture, the calcium drier should be followed with the same kind of an apparatus, except that calcium oxide should be used as the drying agent in place of calcium chloride.

Calcium oxide will absorb the remaining moisture over a longer period of time, and presents less danger of being carried through the system with the refrigerant. The calcium oxide drier may be left in the system indefinitely, and has a tendency to keep the methyl sweet, for it has a neutralizing base.

Neither calcium chloride or calcium oxide are soluble in oil, but both will absorb moisture from the oil in the system, as well as from the refrigerant.

PATENTS

ISSUED NOV. 28, 1933

1,936,575. METHOD OF AND APPARATUS FOR MAKING CHIP ICE. Arthur M. Barrett and Louis N. Udell, Chicago, Ill. Application Dec. 4, 1931. Serial No. 578,922. 23 Claims. (Cl. 62—164.)

1. In apparatus for making chip ice, a freezing unit consisting of a hollow body of heat-conducting material, means for passing a freezing medium through the interior of said body, heating strips embedded in a wall of said body and dividing said wall into a plurality of freezing surfaces bounded by said heating strips, and means for passing a heating medium through said strips.

1,936,624. LOCKING CAP FOR FASTENERS. Alfred W. Gelpcke, Brooklyn, N. Y., assignor to The Rawlplug Co., Inc., New York, N. Y. Application Oct. 3, 1931. Serial No. 568,544. 3 Claims. (Cl. 85—55.)

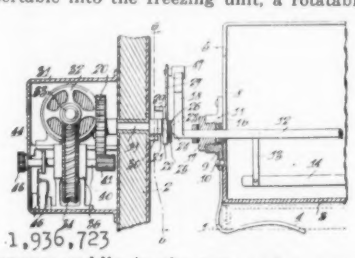
1. Means for covering the head of a fastener after the same has been forced into fastening position comprising; a washer to receive the head by admitting said mixture at successively lower points in the path of the refrigerated liquid, and then conducting the cooled and dried mixture through a cold absorbing zone.

1,936,646. BURNER. Albert C. Smith, Woodside, N. Y., assignor to Electrolux Servel Corp., New York, N. Y., a corporation of Delaware. Application May 7, 1930. Serial No. 450,380. 6 Claims. (Cl. 158—117.1.)

1. In a burner for gaseous fuel, means for shutting off the flow of fuel to the burner when the flame is extinguished, a bypass valve for permitting flow of gas in order that the burner may be lighted, manual operating means for said bypass valve, and a valve for controlling the volume of gas flowing to the burner adjustable by said manual operating means without affecting position of said by-pass valve.

1,936,723. ICE CREAM FREEZER. Lucius A. Lindsey, Atlanta, Ga. Application Sept. 9, 1931. Serial No. 561,943. 13 Claims. (Cl. 259—110.)

1. In combination with the freezing unit and door of a refrigerator, of a pan insertable into the freezing unit, a rotatable



1,936,723

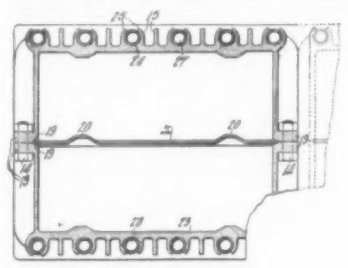
scraper paddle in the pan, and a power applying unit mounted on the door for actuating said paddle when the door is closed, and means for automatically stopping the paddle and holding it out of the contents of the pan when said power applying unit ceases its function.

1,936,848. BEVERAGE DISPENSING DEVICE. Alfred F. Masury, New York, N. Y., assignor to International Motor Co., New York, N. Y., a corporation of Delaware. Application Feb. 23, 1933. Serial No. 658,108. 9 Claims. (Cl. 62—91.5.)

1. A dispensing device comprising a housing, a container supported by the housing, a compartment on the housing to receive a refrigerant, means to communicate between the container and the compartment, and means to circulate a fluid within the housing and adjacent the container and compartment.

1,936,889. REFRIGERATION UNIT. Viggo V. Torbensen, Cleveland, Ohio. Application Nov. 24, 1930. Serial No. 497,771. 19 Claims. (Cl. 62—95.)

12. A refrigeration unit including a casing having positionally fixed walls, a refrigerating tube adapted to be remov-



1,936,889

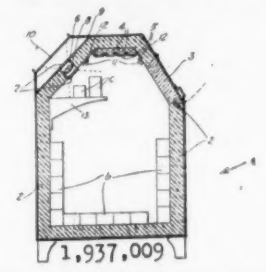
ably extended over walls of said casing, and releasable means on said casing to hold said tube in position after the same is extended over said walls.

1,936,921. REFRIGERATOR CAR DOOR FASTENER. Sven J. Strid, Chicago, Ill. Application Jan. 9, 1932. Serial No. 585,677. 4 Claims. (Cl. 292—340.)

4. In a door fastener, a keeper comprising a body portion, attaching flanges on one end of said body portion, the plane of said flanges being arranged at an angle to the axis of the body portion, the free end of said body portion having symmetrically arranged inclined surfaces converging outwardly, said free end having a latch engaging shoulder adjacent to each inclined surface inwardly thereof.

1,937,009. REFRIGERATING CABINET. Ransom W. Davenport, Detroit, Mich., assignor to Chicago Pneumatic Tool Co., New York, N. Y., a corporation of New Jersey. Application May 8, 1930. Serial No. 450,698. 2 Claims. (Cl. 88—24.)

1. A refrigerator cabinet for frozen foods having heavily insulated walls on all sides and providing a large storage space and a



1,937,009

smaller space for display purposes, means for maintaining said cabinet at a temperature below 15° F., one of the walls of said cabinet adjacent the top being at an incline and having an aperture therethrough, a support beneath said aperture for articles to be displayed and dividing the display space from the storage space, a superstructure including a screen above said inclined wall and aperture but within the vertical and horizontal projections of said cabinet, optical means within said aperture for throwing upon said screen a substantially full-size image of the articles on said support, said optical means including a lens, and sheets of thick transparent material across said aperture on opposite sides of said lens but in spaced relation thereto for restricting heat losses through said aperture.

1,937,174. ART OF BRIQUETTING MATERIALS. William H. Taylor, Milwaukee, Wis., assignor to The Vilter Mfg. Co., Milwaukee, Wis., a corporation of Wisconsin. Application March 16, 1932. Serial No. 599,191. 29 Claims. (Cl. 62—172.)

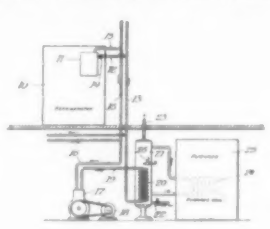
1. The process of producing briquets, which comprises, compressing granular material into bodies of definite shape, and utilizing the shape of the bodies to conduct the same in succession away from the compressing media.

1,937,238. AIR CONDITIONING PLANT. Lloyd L. Mahon, Topeka, Kan. Application Nov. 26, 1932. Serial No. 644,533. 2 Claims. (Cl. 257—9.)

2. An air conditioning plant of the class described comprising a casing having air intake and discharge means, a centrally apertured partition in said casing dividing it into upper and lower compartments, means in the upper compartment in alinement with said aperture for either heating or cooling the air passing through said upper compartment, and means in the lower compartment for pre-treating the air before it is allowed to pass into said upper compartment, said last named means being in communication with the air intake means and including a casing having its top open and in communication with the upper compartment through said aperture, a fan housing in the lower part of the last mentioned casing, a motor driven fan in said housing, a hood-like shield supported on said housing at the upper portion thereof, and a liquid delivery pipe for delivering liquid to said shield.

1,937,288. HEATING AND REFRIGERATING APPARATUS. Max McGraw, Chicago, Ill., assignor to McGraw Electric Co., Chicago, Ill., a corporation of Delaware. Application Jan. 23, 1932. Serial No. 588,263. 4 Claims. (Cl. 62—115.)

1. In combination, a refrigerating system including a compressor, a cooling coil, an expansion chamber, a tank surrounding



1,937,288

said cooling coil and adapted to hold water which is heated by said cooling coil, said tank forming part of a hot water system, said coil being located in the lower portion of said tank, and means for maintaining below a predetermined degree the temperature of the water in that portion of the tank in which the cooling coil is located.

ISSUED DEC. 5, 1933

1,937,545. REFRIGERATOR. Edmund D. Campbell, University City, and William F. Dietrichson, Webster Groves, Mo., assignors to American Car and Foundry Securities Corp., Wilmington, Del., a corporation of Delaware. Application May 23, 1930. Serial No. 455,032. 2 Claims. (Cl. 62—91.5.)

1. In a refrigerator, a chamber to be refrigerated having side walls and a roof, an air conduit formed between a side wall and the roof, air inlet and outlet means in said conduit, closed longitudinally spaced refrigerant holding containers depending from said roof within said conduit and each being provided with an air duct extending through opposite walls thereof, said duct being inclined downwardly from adjacent said inlet to adjacent said outlet means.

1,937,546. AIR CONDITIONING SYSTEM. Edmund D. Campbell, University City, and Wallace H. Herdlein, St. Louis, Mo., assignors to American Car and Foundry Co., New York, N. Y., a corporation of New Jersey. Application March 16, 1932. Serial No. 599,178. 25 Claims. (Cl. 257—7.)

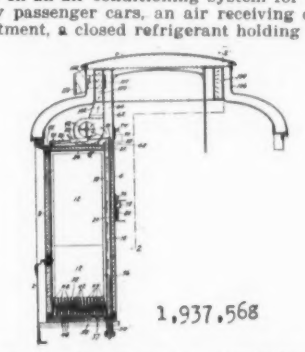
1. In an air conditioning system adapted to and using water ice, an ice chamber, an air conditioning cabinet having a spray chamber, substantially continuously operating means for forcing water from the ice chamber to the spray chamber, means for returning the water from the spray chamber to the ice chamber, a cooling coil in the cabinet having a discharge means out of the system, and intermittently operating pump means for conducting excess water from the ice chamber to the cooling coil.

1,937,555. EXPANSION DEVICE. Harry S. Estler, Detroit, Mich., assignor to Chicago Pneumatic Tool Co., New York, N. Y., a corporation of New Jersey. Application Nov. 28, 1930. Serial No. 498,565. 4 Claims. (Cl. 62—127.)

1. An expansion member having an orifice therethrough, a pin extending through said orifice on both sides, said pin having a coil spring encircling the same and engaging one face of said member and having a bent end engaging the other side of said member to form a stop.

1,937,568. AIR CONDITIONING SYSTEM FOR RAILWAY CARS. Wallace Herdlein, St. Louis, Mo., assignor to American Car and Foundry Co., New York, N. Y., a corporation of New Jersey. Application Dec. 21, 1932. Serial No. 648,195. 9 Claims. (Cl. 62—24.)

2. In an air conditioning system for railway passenger cars, an air receiving compartment, a closed refrigerant holding con-



1,937,568

tainer therein, means for circulating air from the passenger compartment of the car into surface contact with the refrigerant holding container, and a refrigerant supporting grate arranged within the container and connected to opposite walls thereof and formed with a plurality of air ducts extending through the said opposite walls of the container.

1,937,648. PRECOOLING MEANS FOR REFRIGERATOR CARS. Horace Gidding, San Francisco, Calif. Application July 26, 1932. Serial No. 624,734. 5 Claims. (Cl. 62—24.)

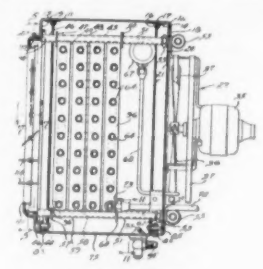
1. In a refrigerator car having a refrigerant compartment and a cargo compartment, a bulkhead separating said compartments, said bulkhead being spaced from the floor and roof of the car; an apertured false floor in the cargo compartment spaced above the main floor; a fan in the lower portion of the refrigerant compartment, said fan having an air inlet positioned to receive air from said refrigerant compartment; a directing funnel forming the air outlet for said fan, said funnel having a low wide mouth positioned adjacent the floor of the car to direct the air under said bulk head and said false floor; and means for driving said fan.

1,937,649. AUXILIARY COOLING SYSTEM FOR REFRIGERATOR CARS. Horace Giddings, San Francisco, Calif. Application July 26, 1932. Serial No. 624,735. 3 Claims. (Cl. 62—20.)

1. In a refrigerator car having an ice tank and a cargo compartment, a receptacle in the lower portion of said ice tank; an apron surrounding said receptacle and sloping toward it for collecting the water from the melting ice in said tank and draining it into said receptacle; a cover for said receptacle consisting of a perforated metal plate and a superposed wire mesh screen, and a discharge pipe leading from said receptacle through the lower portion of said cargo compartment.

1,937,669. HEAT INTERCHANGE DEVICE. John R. Replogle, Detroit, Mich., assignor to Copeland Products, Inc., a corporation of Michigan. Application Sept. 28, 1931. Serial No. 565,451. 21 Claims. (Cl. 62—134.)

8. In a heat interchange device, a frame including rods disposed substantially in rectangular relation, a heat interchange



1,937,669

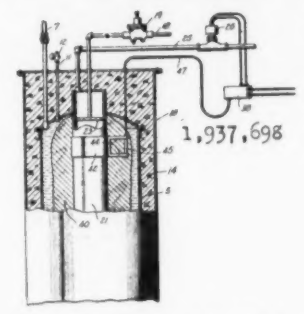
unit between the rods and mounted thereon, annularly extending members connecting the ends of the rods at each end of the frame, a multiple part, annular casing extending around and concealing the frame between the end members, and means releasably connecting the parts of the casing operatively to the frame so that the casing may be removed without disturbing the frame arrangement.

1,937,690. APPARATUS FOR REFRIGERATION. William Lloyd Gilchrist, Albany, Ore., assignor, by direct and mesne assignments, of part interests to Thomas P. Gore, Lawton, Okla., Eugene L. Vidal, Keith Kiggins, and Walter K. Bachrach, all of Washington, D. C., and George P. Sacks, Bethesda, Md. Application Aug. 16, 1928, Serial No. 300,075. Renewed April 14, 1933. 6 Claims. (Cl. 62—91.5.)

1. Refrigerating apparatus comprising in combination, a receptacle having a vent, means for supporting solidified gas in said receptacle, and metal pins passing through said receptacle and supporting means affording conductivity of heat therethrough.

1,937,698. WATER COOLING SYSTEM. John F. Hoffman, Omaha, Neb., assignor to Baker Ice Machine Co., Inc., Omaha, Neb., a corporation of Nebraska. Application Dec. 29, 1930. Serial No. 505,348. 2 Claims. (Cl. 62—2.)

1. In a water cooler, a storage tank, an expansion chamber located centrally therein, a refrigerant supply line including an



1,937,698

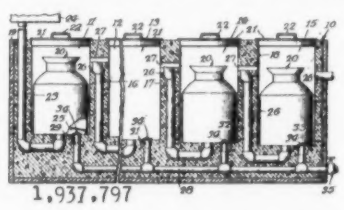
expansion valve connected to a refrigerant distributor in said expansion chamber, a refrigerant return line including a control valve connected to said expansion chamber, a metallic band surrounding said expansion chamber and having parallel arms running therefrom, a tube connected to said arms at their outer ends, a tubing joining said tube with a pressure-actuated switch, and means within said tube and tubing to actuate said switch to operate said control valve.

1,937,705. REFRIGERATION. Samuel Edgar Link, Kansas City, Mo. Application Nov. 8, 1930. Serial No. 494,376. 5 Claims. (Cl. 62—91.5.)

4. A refrigerating unit comprising a box having openings in its upper and lower portions, a hood associated with one of said openings, a valve coacting with the hood, a second box supported within the first box with an intervening space between the boxes, said second box providing a chamber for carbon dioxide ice, and a coil in communication with the inner box and arranged within the intervening space between the boxes.

1,937,797. MILK COOLING APPARATUS. Edwin D. Stafney, Batavia, Ill. Application July 30, 1932. Serial No. 626,584. 7 Claims. (Cl. 62—101.)

1. In combination, a cooling unit comprising a plurality of cooling chambers separated by partitions, said chambers



1,937,797

adapted to receive receptacles, passages for conducting a cooling fluid from the upper portion of each container to the lower portion of the next adjacent chamber and discharging the same upwardly

(Continued on Page 14, Column 1)

PATENTS

(Continued from Page 13, Column 5)

through the central portion of the bottom thereof.

1,937,802. HEAT EXCHANGER. Alvin H. Baer, Waynesboro, Pa., assignor to Frick Co., Waynesboro, Pa., a corporation of Pennsylvania. Application Oct. 12, 1931. Serial No. 568,441. 4 Claims. (Cl. 62—126.)

1. A heat exchanger comprising a shell having end plates secured to and closing each end, additional plates secured to said end plates so as to form fluid chambers at the ends of the shell, one of said chambers having a partition therein dividing it into two compartments, a fluid inlet to one compartment and a fluid outlet from the other, a plurality of tubes secured in the end plates and connecting the chambers at each end of the shell, dished baffle plates positioned within the shell having their ends secured to the end plates on the shell, said baffle plates being positioned so as to extend over a group of the said tubes, the baffle plates being open at their tops to permit circulation of fluid upwardly through the shell and between the said tubes, a plurality of inlets for cooling fluid into the shell, and a suction positioned adjacent the top of the shell for drawing off evaporated cooling fluid, substantially as set forth.

1,937,804. HEAT EXCHANGER. William W. Barnum, Niagara Falls, N. Y. Application Nov. 16, 1932. Serial No. 642,948. 7 Claims. (Cl. 257—186.)

1. A heat exchanger of the character described comprising a vertical brine receptacle having downwardly inclined walls, a cooling coil mounted in the brine receptacle, means for causing a liquid to flow over the outer surface of the brine receptacle, means for collecting the liquid after it has flowed over the entire surface of the brine receptacle and removable protecting walls for confining the area over which the liquids contacts.

1,937,809. REFRIGERATING MACHINE. Leon Buehler, Jr., Waynesboro, Pa., assignor to Frick Co., Waynesboro, Pa., a corporation of Pennsylvania. Application July 28, 1930. Serial No. 471,373. 4 Claims. (Cl. 62—126.)

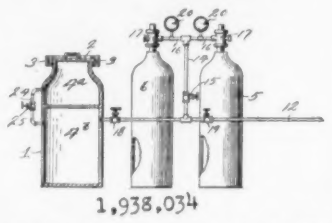
1. In a refrigerating system an evaporator cooler, a float chamber, a refrigerant supply line, a valve in said line for controlling the flow of refrigerant to the cooler, a float in the said chamber for controlling the said valve in response to the liquid level in the chamber, pipes connecting the said chamber with the lower part of said cooler and connecting the upper part of said chamber with the upper part of said cooler to equalize liquid levels in the chamber and cooler, the said valve opening on a lowering of the liquid in the chamber and closing upon rising of the liquid in the chamber, a suction line from the said cooler to the compressors in the system, and a pump-out connection between said suction line and the lower part of the said chamber, said last-named line having a valve therein, substantially as set forth.

1,937,984. REFRIGERATING CONTROL SYSTEM AND METHOD. Paul A. Scherer, Medford, Ore., and Grahame B. Ridley, San Francisco, Calif., assignors to Southern Oregon Sales, Inc., Medford, Ore., a corporation of Oregon. Application June 24, 1930. Serial No. 463,544. 6 Claims. (Cl. 62—101.)

1. A method of the character described characterized by the use of a heat absorber, compressing means connected to compress volatilized refrigerant removed from the heat absorber, heat exchange means connected to the compressing means and serving to condense compressed refrigerant and to return the same back to the absorber, and a brine recirculation cycle adapted to remove heat from said absorber; said method comprising causing a portion of the brine from said recirculation cycle to absorb heat from said heat exchange means.

1,938,034. LIQUEFIER FOR SOLIDIFIED GAS. Thomas F. Lundy, Tulsa, Okla., assignor to CO_2 Appliance Co., Tulsa, Okla. Application Dec. 15, 1932. Serial No. 647,468. 3 Claims. (Cl. 62—91.5.)

3. A combined gas generating and storage plant comprising a liquefier container having a chamber for the reception of



1,938,034

solidified gas and a second chamber into which gas from the first mentioned chamber is transferred, means for controlling the flow of gas between said chambers of the liquefier container, a discharge pipe in connection with the liquefier container, a storage container in connection with the discharge pipe, means whereby gas from the discharge pipe and liquefier container may be discharged into the storage tank and means whereby gas from the storage tank may be discharged through the discharge pipe by-passing the liquefier container.

1,938,141. PORTABLE ELECTRIC REFRIGERATOR AND CASING THEREFOR. Mordecai Goldkind, Washington, D. C. Application May 19, 1932. Serial No. 612,314. 8 Claims. (Cl. 62—117.)

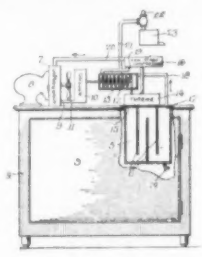
1. In combination with a vehicle, a trunk rack, a trunk mounted on said trunk rack, an electric refrigerator within said trunk, said refrigerator having a plurality of legs, said legs having extensions, and a single means extending through a portion of said trunk and leg extensions for positioning the trunk and refrigerator upon the trunk rack.

1,938,166. CONTINUOUS ABSORPTION REFRIGERATING MACHINE. Edmund Altenkirch, Neuenhagen, near Berlin, Germany, assignor, by mesne assignments, to The Hoover Co., North Canton, Ohio, a corporation of Ohio. Application Feb. 15, 1929, Serial No. 340,100, and in Germany Feb. 22, 1928. 20 Claims. (Cl. 62—119.)

17. In continuous absorption refrigerating apparatus, in which an auxiliary agent is employed as a pressure equalizing medium, a large absorber, a small absorber, means for causing a mixture of refrigerant vapor and auxiliary agent to pass through said large absorber and then into said small absorber and means for supplying absorption liquid of a different temperature to each of said absorbers.

1,938,205. REFRIGERATION SYSTEM. Lucien I. Yeomans, Chicago, Ill. Application Nov. 1, 1929. Serial No. 403,943. 4 Claims. (Cl. 62—98.)

1. In a refrigerating system of the class described, the combination of two mechan-



1,938,205

ically independent compression machines communicating with each other, primary power means for operating one of said machines, and a rotary machine operable to expand the refrigerant delivered by said last mentioned compression machine and to derive power which is applied to drive said other compression machine at a speed different than the speed of said power means.

1,938,218. COMPRESSOR VALVE. Arthur E. Dempsey, Jr., Council Bluffs, Iowa, assignor to Baker Ice Machine Co., Inc., Omaha, Neb., a corporation of Nebraska. Application June 8, 1931. Serial No. 542,809. 8 Claims. (Cl. 230—230.)

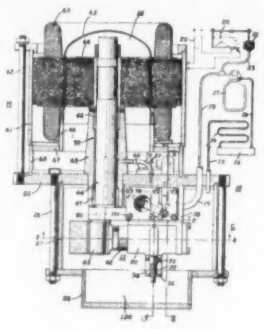
1. In a device of the character described, a valve seat member including an apertured cylindrical wall, a valve comprising a split ring increasing in thickness from the ends to the center thereof located on said wall in covering relation with the apertures therein, and means engaging the thickest portion of the ring for retaining said portion in engagement with the wall.

1,938,316. REFRIGERATING APPARATUS. Eastman A. Burrows, Chicago, Ill., assignor to Thomas D. Huff, Chicago, Ill. Application Oct. 13, 1926, Serial No. 141,408. Renewed April 27, 1933. 3 Claims. (Cl. 62—99.)

1. In a device of the class specified, the combination of a cooling support provided with refrigerating means in combination with a support comprising a spaced rack-like structure for a cooling medium above said cooling support.

1,938,451. COMPRESSING APPARATUS. William B. Floyd and Alex A. McCormack, Dayton, Ohio, assignors to Frigidaire Corp., Dayton, Ohio, a corporation of Delaware. Application June 30, 1930. Serial No. 464,959. 2 Claims. (Cl. 230—58.)

1. In a compressing unit, a compressor, a casing enclosing said compressor, dis-



1,938,451

charge means for said compressor, intake means for said compressor, one of said means being normally in communication with the interior of said casing, both of said means having passages to the wall of said compressor, a unitary unloading device attached to the wall of said compressor having a valve opening and closing a connection with the means not normally in communication with the interior of the casing, a pressure responsive device for operating said valve, said pressure operable device being actuated at a predetermined speed of the compressor.

1,938,522. DEAERATING FREEZING PROCESS AND APPARATUS THEREFOR. Ralph V. Grayson, Atlanta, Ga., assignor of 50 per cent to E. G. Ballenger, C. M. Foster, and F. M. Bird, all of Atlanta, Ga., as organizers of Refrigeration Patents and Processes, Inc., a corporation to be organized under the laws of Georgia. Application Dec. 20, 1930. Serial No. 503,828. 2 Claims. (Cl. 62—114.)

1. De-aeration freezing system for liquids comprising a reservoir, a freezer and a discharge tank in valved, serial communication in the order named, said discharge tank having a valve controlled atmospheric outlet, means for maintaining a vacuum in said freezer and discharge tank during the freezing period, means for admitting an oxygenless gas to said discharge tank, up to atmospheric pressure, to permit gravital discharge of its contents, and means for holding the vacuum in said freezer during the discharge period of said discharge tank.

Specifications of Standard Models

Sanitary Refrigerator Co., Fond du Lac, Wis.

Model No.	41	45	68	75	98	120
Cabinet Specifications						
Overall dimensions (in.)						
Height	52½	51¾	56⅛	59⅛	59⅛	63⅛
Width	23	24⅝	29	29	36	40⅛
Depth	23½	22	26	26	26	26
Inside dimensions of liner (in.)						
Height	23½	28	30	33	33	35⅛
Width	17⅝	19¼	22⅝	22⅝	29⅝	34
Depth	16¾	14½	17¼	17¼	17¼	17⅛
No. of doors	1	1	1	1	2	2
Storage Capacity						
Gross food storage capacity (cu. ft.)	4.1	4.5	6.9	7.6	9.9	12.2
Net food storage (cu. ft.)	3.40	4.16	6.34	6.96	9.15	10.80
No. of shelves	3	3	5	5	7	8
Total shelf area (sq. ft.)	7.0	8.4	14.5	14.5	19.4	23.1
Ice Cube Trays						
No. of trays	2	2	3	4	4	4
No. of cubes produced	42	56	84	112	112	84
Weight of cubes (lbs.)	3	4	6	8	8	11⅛
Thickness of Insulation						
Top (in.)	2½	2½	3	3	3	3
Sides (in.)	2½	2½	3	3	3	3
Bottom (in.)	2½	2½	3	3	3	3
Compressor Specifications						
Compressor capacity (lbs.) I.M.E.	92	92	92	92	92	145
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛	¼
Standard speed (r.p.m.)	530	530	530	530	530	440
Compressor bore (in.)	1½	1½	1½	1½	1½	1¾
Compressor stroke (in.)	1½	1½	1½	1½	1½	1¾
Refrigerant in system (lbs.)	3	3¼	3¾	4	4	6
Lubricant in system (oz.)	8	8	8	8	8	16
Weight, net (lbs.)	275	255	320	360	365	460
Price, f.o.b. factory, including tax	..	$105	$146.60	$162.75	$192	$241.80

• • •

Cabinet Materials

Make of cabinet ..... Sanitary
Material used for frame ..... Wood
Finish of shelves ..... Tinned
Material used for breaker strip ..... Model 41—wood; others—composition
Material used for gasket ..... Rubber

Finish

Cabinet finish (exterior) ..... Lacquer
Cabinet finish (interior) ..... Porcelain

Hardware

Process of manufacture ..... Cast & stamped
Basic metal of hardware ..... Brass
Finish of hardware ..... Chromium

Evaporator

Evaporator construction ..... Models 41 & 120—tubular; others—shell
Metal used ..... Models 41 & 120—copper & brass; others—steel
Type of refrigerant control ..... Low side float

Condenser

Method of cooling ..... Fan
Type of condenser ..... Finned tube

Compressor

Type of system ..... Conventional
Type of compressor ..... Reciprocating
Compressor drive ..... Belt
Location of compressor ..... Below

Motor

Type of motor ..... Capacitor & repulsion-induction

Control

Type of control ..... Temperature
Temperature regulation method ..... Manual
How defrosted ..... Wide cycle defrosting mechanism

Refrigerant

Refrigerant used ..... Sulphur dioxide

Special Features

Interior electric light on all models but 41.

Policy

Guarantee on system ..... Three years
Serviced by ..... Dealer or distributor
Are replacement parts furnished to independent service companies ..... Yes

Exports of Electric Refrigerators

October, 1933, Shipments Reported by the Bureau of Foreign and Domestic Commerce, Washington, D. C.

	Electric Household Refrigerators		Electric Commercial Refrigerators Up to 1 Ton		Parts for Electric Refrigerators
	Number	Value	Number	Value	Value
Austria	22	$ 743	...	...	$ 362
Belgium	17	1,246	107	$ 8,740	6,794
Czechoslovakia	25	915	1	193	2,854
Denmark	...	...	1	107	869
Finland	7	445	1	108	...
France	458	30,267	102	12,592	20,116
Germany	55	3,423	...	...	7,833
Hungary	1	63	...	...	...
Iceland	1	584	...	...	...
Irish Free State	2	189	...	...	322
Italy	8	491	2	245	3,121
Malta, Gozo, and Cyprus	...	...	...	...	13
Netherlands	25	2,007	5	811	4,633
Norway	10	864	1	226	899
Poland and Danzig	9	877	1	192	15
Portugal	3	379	1	157	110
Rumania	...	...	...	...	28
Soviet Russia in Europe	...	...	...	...	13
Spain	48	3,350	24	2,407	6,676
Sweden	10	898	3	401	1,463
Switzerland	350	19,951	57	5,796	12,787
United Kingdom	13	936	10	4,476	12,497
Canada	81	5,604	19	2,323	9,909
British Honduras	1	79	...	...	...
Costa Rica	9	764	...	...	45
Guatemala	6	534	...	...	323
Honduras	18	2,141	...	...	520
Nicaragua	3	272	...	...	...
Panama	40	5,104	3	486	1,676
Mexico	125	10,441	4	821	2,062
Newfoundland and Labrador	...	...	...	...	25
Bermudas	28	2,926	2	995	445
Barbados	20	1,865	...	...	113
Jamaica	33	4,402	2	633	201
Trinidad and Tobago	5	527	...	...	485
Other British West Indies	12	830	1	200	124
Cuba	33	2,643	5	390	604
Dominican Republic	73	5,837	...	...	84
Netherland West Indies	19	2,013	2	473	63
French West Indies	13	1,705	...	...	...
Haiti, Republic of	5	369	1	116	10
Virgin Islands of U. S.	2	165	...	...	67
Argentina	404	25,510	144	11,500	36,367
Brazil	373	31,801	35	5,219	6,798
Chile	6	366	...	...	41
Colombia	51	4,528	3	341	860
Ecuador	1	56	...	...	...
British Guiana	7	651	...	...	19
Surinam	10	1,046	...	...	...
Peru	27	1,171	...	...	98
Uruguay	43	2,308	...	...	558
Venezuela	48	4,871	1	114	79
Arabia	...	...	...	...	736
British India	215	18,518	16	1,966	4,537
British Malaya	99	9,160	4	633	392
Ceylon	12	1,191	...	...	...
China	97	7,647	1	571	1,473
Netherland East Indies	274	29,659	19	7,006	2,788
French Indo-China	7	994	23	2,760	734
Hong Kong	25	2,229	...	...	741
Iraq	...	...	...	...	20
Japan	...	...	...	...	2,045
Palestine	22	3,106	1	116	2,297
Philippine Islands	195	19,435	24	2,952	1,049
Siam	34	3,538	...	...	15
Syria	2	278	2	252	74
Turkey	4	240	...	...	71
Australia	491	36,636	...	...	19,231
New Zealand	29	2,258	10	931	859
Union of South Africa	1,606	141,270	7	635	10,055
Other British South Africa	19	1,821	...	...	390
Gold Coast	...	...	...	...	125
Nigeria	...	...	...	...	16
Egypt	34	3,471	3	914	667
Algeria and Tunisia	20	2,090	14	1,495	619
Other French Africa	9	826	...	...	...
Morocco	77	7,896	8	991	286
Mozambique	5	487	...	...	...
Canary Islands	4	279	...	...	83
Other Spanish Africa	4	218	...	...	2
Total	5,850	$481,404	670	$ 81,284	$192,286
Shipments to Hawaii	440	$ 43,732	31	$ 5,541	$ 5,928
Puerto Rico	220	$ 24,664	8	$ 1,445	$ 1,580

QUESTIONS

Dole's Address

No. 1455 (Distributor, Virginia)—"In your issue of Dec. 6 you show pictures of Dole Vacuum Plate coil installations. Please advise the name and address of the manufacturer of these coils."

Answer—Dole Refrigerating Machine Co., 663 W. Washington Blvd., Chicago, Ill.

Ice Cubes from Ice Cream Cabinets

No. 1456 (Distributor, Iowa)—"Will you please furnish information about manufacturers of a wire basket or holder that will fit into an ice cream cabinet to freeze ice cubes. We feel that there will be a market for a few of these now that prohibition has been repealed."

Answer—Inland Mfg. Co., 15 Coleman Ave., Dayton, Ohio, or Chicago Refrigeration Service Co., 360 W. Grand Ave., Chicago, Ill.

Gilmer Belts

No. 1457 (Distributor, Canada—"Will you be good enough to advise us the address of the Gilmer Belt Co?"

Answer—L. H. Gilmer Co., Keystone & Cottman Sts., Philadelphia, Pa.

Pressure Recorders

No. 1458 (Distributor, New York)—"We would like to know where to purchase a meter for recording the back pressure of a refrigerator during the course of its running 24 hours?"

Answer—The following can probably supply you:
Bristol Co., Waterbury, Conn.
Foxboro Co.
Neponset Ave., Foxboro, Mass.
C. J. Tagliabue Mfg. Co.
Park & Nostrand Aves., Brooklyn, N. Y.
Taylor Instrument Co.
95 Ames St., Rochester, N. Y.
United States Gauge Co.
44 Beaver St., New York, N. Y.

Sparklets

No. 1459 (Distributor, New Jersey)—"Kindly give us the name and address of the company which makes Sparklets. We need some repair parts for this bottle."

Answer—So far as we know, these are available only from the English company: Sparklets, Ltd., Angel Road, N. 18, London, England.

Sunbeam Appliances

No. 1460 (New York)—"Will you please let us know the name of the company which manufactures Sunbeam electric household appliances?"

Answer—Chicago Flexible Shaft Co., Roosevelt Road and Central Ave., Chicago, Ill.

Sulphur and Methyl Users

No. 1461 (Manufacturer, Illinois)—"Kindly give us a list of firms in this country that manufacture ammonia ice machines; also those that make methyl chloride commercial machines."

Answer—Refer to the Aug. 23 issue of ELECTRIC REFRIGERATION NEWS for specifications of commercial condensing units, giving among other data the refrigerant used by each.

Small Water Cooler

No. 1462 (Manufacturer, Indiana)—"We have an order for 30 small refrigerators which have to be supplied with water coolers. These coolers are to be of the type that is placed inside the refrigerator, but not permanently installed. Can you give me the names of manufacturers of such water coolers?

"Since the refrigerator is quite small, the cooler should have a capacity of about two quarts, certainly not over a gallon. I have communicated with Federal Enameling, Columbian Enameling, and Bellaire, but have not yet heard from them, and do not believe they make anything this small."

Answer—Try Hamburg Bros., 963 Liberty Ave., Pittsburgh, Pa.

Specifications

No. 1463 (Installation firm, New York)—"Where can I secure a complete set of specifications on all makes of mechanical refrigerators, and how can I arrange to secure them as they are issued in the future?"

Answer—Specifications of household refrigerators were published in the March 22 issue of ELECTRIC REFRIGERATION NEWS, and specifications of commercial machines were published in the Aug. 23 issue of the NEWS. Both sets of specifications are to be revised for the 1934 REFRIGERATION DIRECTORY which will appear early next year.

Questions, Questions

No. 1464 (Subscriber, New York)—"Kindly publish as soon as possible whatever information you have on the following subjects:

"What happened to Majestic? Will they continue, and if so under what management? Please give the names and titles of their officers, sales managers, service manager, etc.

"What is the latest information about Copeland, and who heads up their several departments?

"What are the patents in connection with air conditioning and air-conditioning controls? Who are they owned by, and how will the leasing be handled?

"What is the latest information on the development of new refrigeration gases?

"Will the NRA prevent the Southern Power Co. and others from giving 'Lifetime Service' etc., thus allowing other manufacturers to enter certain southern cities?

"What is the opinion on the new Los Angeles code regulating service men? Will it not work a considerable hardship even on the best of service organizations and manufacturers, because of its provisions of claim by customers or users? Are plumbers, electricians, steamfitters, radio service men, etc. to be regulated in the same strict manner?

"It is time the chemical companies produced a dryer for refrigerating gases. In my opinion both calcium chloride and calcium oxide are injurious to a refrigerating system.

"Please publish the methods of figuring humidity under all conditions and by the several systems, the meaning and application of dew-point, and the meaning of other terms used in air conditioning."

ROBOT TO DEMONSTRATE GRUNOW 'LIVING TONE'

CHICAGO—Employment of a robot promotional stunt on a nation-wide scale to demonstrate the "living tone" feature of the new Grunow radio is being planned by General Household Utilities Corp., according to J. J. Davin, sales promotion manager.

The stunt was tried out at the Philadelphia Electrical Show by Philadelphia Distributors, Inc., Grunow wholesaler in the Quaker City, and drew crowds estimated at from 10,000 to 15,000 people, according to George Gaidzik, member of the sales promotion department, who put on the stunt.

The promotion will tie in with the emphasis placed on the "living tone" feature in national advertising. It is suggested that dealers put on the demonstration at electrical shows, food shows, club meetings, schools, and fairs.

In the demonstration a man dressed in a robot costume comes out from behind a curtain when called by the master of ceremonies, and sits down at a mechanical piano with hands over the keyboard. The player piano is plugged in and the robot sit motionless until it stops. He then retires behind a curtain.

A local pianist is then invited to play a selection, after which the Grunow radio is turned on, and the difference between "living tone" and mechanical tone explained to the audience.

Leonard Will Issue 'Sales Points'

DETROIT—"Sales Points," a new sales training service for distributors and salesmen, is being started by the Leonard Refrigerator Co. here.

First book in the series is devoted to features of the 1934 Leonard line. "Sales Points" will be issued monthly on a subscription basis, according to Godfrey Strelinger, Leonard sales manager.

Grunow Promotes Sales With Tabloid Paper

CHICAGO—General Household Utilities Co. has provided its dealers with promotional literature in the form of a tabloid newspaper, designed for promotion of holiday business.

Duane Wanamaker, advertising manager, prepared the four-page, five-column paper bearing the name "Grunow News"; 250,000 copies have been distributed to retailers.

CLASSIFIED

PAYMENT in advance is required for advertising in this column.

RATES: Fifty words or less, one insertion $2.00, additional words four cents each. Three insertions $5.00, additional words ten cents each.

POSITIONS WANTED

TEN YEARS' merchandising electrical refrigeration. Thirty-five years old. Exceptional analytical ability. Dynamic and intensive in operations. Exceptional personal sales ability, leadership and ability to attract most successful men in industry. Now district sales manager, national organization eastern territory. Could open up 10 highest class distributors next 30 days. Now available. Box 605.

INDEPENDENT SERVICE COMPANIES

HALECTRIC Thermostat repair service, Ranco, B & B, Two dollars each, one year guarantee, prompt service. Halectric Laboratory. 1793 Lakeview Road, Cleveland, Ohio.

Trilling & Montague Salesmen Near End Of Contest

PHILADELPHIA — Two hundred dealers and salesmen of Norge refrigerators and Zenith radios for Trilling & Montague, distributor here, met Dec. 5 at the company's headquarters to receive a send off for the final period in Trilmont's holiday sales campaign. Quota-busters in the drive will have a free trip to Bermuda the last week in December.

Speakers at the meeting were David M. Trilling of the distributorship; Glenn O'Harra, Norge Corp.'s eastern sales manager; Sherman Griselle, merchandising counselor; and Jack Lobel, Trilmont sales manager.

On Dec. 6, the distributor was host to a group of recent purchasers of ABC oil burners. At this promotional meeting, speakers were Mr. Trilling; Joseph Hirsch, vice president of the Automatic Burner Corp.; W. A. Doerman, eastern ABC sales representative; and Roy Knipschild of Rosenow Co., Chicago.

SOUTHERN WHOLESALERS HAS 'PAY-OFF CAMPAIGN'

WASHINGTON, D. C.—Southern Wholesalers, Inc., of this city and Baltimore recently sponsored a sales contest called the "Pay-Off Campaign," and involving distribution of $1,000 in prizes.

A large bulletin board was erected in the office, with 300 gold seals attached. Under each seal was a slip, with the amount of a prize indicated upon it. Prizes ranged from $1 to $25.

Each sale of a Leonard lacquer refrigerator entitled the salesman to one prize, which he selected by pulling off a seal.

Elwood to Head Sales Of Dustop Filters

TOLEDO—James L. Elwood has been appointed sales manager of Dustop glass-wool air filters by the Owens-Illinois Glass Co. here.